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ABSTRACT

The final report presents progress of a project investigating compliance and noncompliance among severely handicapped students. Details are reported for each of the project's three years: from initial conceptualization of compliance and noncompliance, to training on the Microprocessor Operated Recording Equipment (MORE), to studies on the effects of various interventions (including precision teaching) on noncompliant behavior. Results of a study on the effects of structured programs concluded that the effect on generalized compliance was minimal. All-day compliance programs resulted in findings that were difficult to interpret. Repeated mandates used to improve the compliance of severely handicapped students appeared to be a promising approach. Latency analyses suggested that there is little reason to wait more than a few seconds for a pupil to respond to a compliance request. Extensive appendixes include MORE observation codes, an overview of data-based performance rules in making daily classroom decisions, and latency analyses charts. (CL)

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# FIELD INITIATED RESEARCH STUDIES
# OF
# COMPLIANCE AND EDUCATIONAL PROGRESS IN SEVERELY AND PROFOUNDLY HANDICAPPED STUDENTS

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FINAL REPORT

FY 1982-83

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## 1.0 INTRODUCTION

When a severely handicapped student fails to respond correctly to a request for a particular behavior it raises the question of whether the child does not know how to perform the task or actually does have the skill but is simply "choosing" not to display it. The problem of identifying noncompliance is of critical importance to the development of an appropriate educational plan for any given student. When a teacher does not know if the child is generally compliant or generally noncompliant, instructional methods may be employed that will not maximize the child's educational progress.

The Compliance Project has just completed its third year of investigations of compliance and noncompliance and has identified several issues of interest relating to the interactions among severely handicapped students and their teachers. The project goals have been three-fold: 1) to refine the definition of compliance and compliance problems; 2) to establish procedures for assessing compliance and reliably identifying noncompliant pupils; and 3) to identify strategies that classroom managers can use to remediate noncompliance and improve compliance.

It was the project's intention to refine instructional methods which would improve the level of functioning and rate of learning in severely handicapped persons. Unlike projects which seek to develop generally more effective procedures for assisting handicapped individuals to acquire new behaviors, the Compliance Project sought to find ways of ensuring that severely handicapped individuals will consistently and appropriately demonstrate and use those skills which are already within their behavioral repertoire.

This report is the final progress report of the Compliance Project. Following this introduction will be a brief review of the first and second project years. A detailed description of the third project year's research activities and a discussion of results comprise the major portion of the report.

## 2.0 REVIEW OF THE FIRST PROJECT YEAR: FY 80-81

In the first quarter of the first project year, the project staff was hired and trained, a cooperative agreement was made with the Seattle Public Schools, and the observational equipment was purchased. The remainder of the year was spent collecting and analyzing the data from 42 severely handicapped students from seven public school classrooms. The data collected consisted of teacher rankings of the subjects' compliance, an overall performance level assessment from the Uniform Performance Assessment System (UPAS), and data on compliance to general classroom commands collected via the Microprocessor Operated Recording Equipment (M.O.R.E.) data logging equipment.

The following definitions were drafted during the first project year to describe the focus of the project's investigations and to assist in the generation of working hypotheses concerning the manner in which noncompliance problems could be identified and treated:

Compliance - The consistent, timely and correct production of a behavior, currently in the person's repertoire, in response to a request for that behavior and/or in the presence of the naturally occurring stimuli which have in the past occasioned such behavior.

Noncompliance - The failure to produce a behavior in a consistent, timely and correct manner in response to a request for the behavior and/or in the presence of the naturally occurring stimuli which should occasion such behavior, despite the fact that the behavior in question is within the behavioral repertoire of the individual.

Colloquially, one might characterize "compliance" as "doing what one can do when one is asked or expected to do it;" and "noncompliance" as "not doing what one is capable of doing, even when asked or expected to do so." Educationally, however, at least with the severely handicapped, matters might not be quite so simple. To further define the phenomena with which the Compliance project was concerned, therefore, the following guidelines were also drafted (note, supportive data and arguments for the guidelines presented below may be found in the original proposal and first year annual report):

### Correct Performance

Although it would be desirable for individuals to always be 100% correct in the production of appropriate behavior, such standards are not always reasonable. For purposes of investigation, therefore, an individual's performances will be considered "acceptably correct" if he/she meets or exceeds the accuracy levels demonstrated by the majority of his/her nonhandicapped peers. For most purposes, such standards might be as low as 67%, but typically exceed 95% for most "academic/vocational" skills and 80% for most "management/social" skills. Demonstration of lower than expected accuracy in response to a stimulus is normally interpreted as evidence that the individual has not yet acquired or mastered the skill in question. As noted below, however, that may not be the case if the child is "noncompliant."

## Timely Performance

A performance will be considered timely if it occurs (or begins to occur) within a reasonable latency of the first opportunity/request for the behavior to occur. As with standards of accuracy, standards of latency for purposes of this investigation were based primarily upon the performances of nonhandicapped peers and/or (in the case of physically impaired children) the limits of performance which are known to be within the physical capabilities of the individual. In most situations, latencies of between one and three seconds are considered acceptable, although teachers of the severely handicapped -- perhaps inappropriately -- frequently allow for much greater latencies with their pupils (see the section entitled latency analysis, later in this report). Latencies exceeding those typically considered acceptable are usually taken as an indication that the pupil is either unsure of the response required (i.e., has not yet fully mastered the skill) and/or that the pupil is physically incapable of responding more rapidly. As will be noted below, however, such might not be the case if the individual is noncompliant.

## Consistent Performance

Consistency of performance may be considered in at least two ways: the overall accuracy with which correct performances are produced within any given session or day (see correct performance, above), and the variability in the accuracy, rate and latency of performances from one trial, session or day to another. Generally, individuals (normal, mildly handicapped or severely handicapped) appear to have a median daily variability of approximately +- 15% (x/1.15) and often vary (in the extremes) as much as x2 or /2 (a doubling or halving of performances) from day-to-day, regardless of whether they are in the process of acquiring a skill (in which case, estimates of variability are based on deviations from the individual's line-of-progress which describes the general rate with which the skill is being acquired) or the skill has been fully mastered (in which case the variability is expressed as day-to-day fluctuations about the individual's average level of performance). Individuals which exceed the normally expected limits of daily variability will be considered "inconsistent." Inconsistency in performance while a child's overall level of performance is still relatively low is considered by most teachers to reflect difficulty in acquiring the skill. It is the contention of the Compliance Project, however, that inconsistencies in daily performance patterns which exceed normal expectancies are reflective of "compliance" problems, not problems in the acquisition of the skill per se.

## Evidence that the Behavior is Currently within the Individual's Repertoire

An individual might fail to perform a skill in response to a specific request for at least three reasons: 1) the skill was never learned or acquired; 2) the skill was once acquired, but not mastered to a level which would ensure maintenance and has been subsequently "lost;" or 3) the skill is within the behavioral repertoire of the individual, but for some reason, the individual "chooses" not to display the skill. In discriminating the last case, the most common evidence of direct noncompliance cited by people is an overt refusal on the part of the individual (e.g., head-shaking; saying "no, I won't"). In the case of severely handicapped individuals, however, such commonly recognized refusal behaviors are not always possible or have not been learned. In lieu of overt refusal, therefore, teachers commonly refer to immediate past history of performance (e.g., the individual was observed to display the requested behavior in the not too distant past) and/or "nonchance" performance patterns (e.g., the individual performs correctly for ten trials in a row, then incorrectly for three trials in a row). Reference to immediate past performance patterns is related to the issue of performance variability (i.e., unusually high rates of correct responding succeeded by unusually low rates) and forms the basis for hypotheses concerning methods for the identification of noncompliance problems.

Based on the definitions and guidelines outlined above, the following hypotheses were developed by the Compliance project:

H1: A certain proportion of severely handicapped individuals found within public school classes will prove to be noncompliant. Specifically, it is hypothesized that as many as 33% of the students in any given class serving the severely handicapped will prove to be noncompliant.

H2: Noncompliant students will demonstrate higher than expected daily variability in their performances on one or more instructional programs and/or in response to general classroom commands, regardless of their overall levels of performance with respect to the requested behaviors. Specifically, it is hypothesized that daily variability of noncompliant students will frequently exceed x/2.0 (i.e., a doubling or halving of performances from day-to-day).

H3: The most effective intervention strategies for dealing with noncompliance will involve the manipulation of consequences for performance (i.e., reinforcers/punishers) and/or contingencies (e.g., allowable latencies before consequation; schedules of reinforcement) and/or some other variable related to the general consequating value of the activity involved. Often, the best method for increasing the consequating value of the activity will be to advance the student to a much higher level in the curriculum where the functional value of the activity will be greater.

H4: The least effective intervention strategies for dealing with noncompliance will involve changes in general instructional tactics (e.g., cues, directions, prompts) which are designed solely to provide the individual with more information about how the behavior is performed and/or changes in curricula designed to make the requested task simpler (e.g., stepping back to a presumed prerequisite skill).

H5: Once compliance has been established with a previously noncompliant severely handicapped individual, dramatic increases in the demonstrated level of functioning of the individual will be observed (i.e., the individual will begin to demonstrate skills previously thought to be well beyond his/her current level of functioning).

Analysis of the data from the first project year indicated that there was general agreement between the classroom teacher's opinion of a child's compliance and the rate and percentage of compliance to general classroom commands as collected by the M.O.R.E. The most significant finding, however, was that there was a high correlation between the subject's UPAS score and the teacher's perception of their compliance. Every pupil with a score on UPAS of greater than 50% was identified as compliant. Not every subject with a lower score was ranked as noncompliant but the consistent identification of those with relatively high scores as compliant was of interest to the project staff.

## 3.0 REVIEW OF THE SECOND PROJECT YEAR: FY 81-82

The procedures used to train observers on the M.O.R.E. equipment were revised from the first project year and resulted in a more efficient training package. Two new observers were trained for the second year's data collection.

The cooperative agreement with the Seattle Public Schools was renewed and teacher participation was again solicited. Four teachers from the first project year agreed to participate in the second project year. The investigations during the second year focused on a reduced number of subjects to get the most information possible on the parameters of compliance and noncompliance. Eleven subjects from the first year were selected to participate in the continued investigations. Seven of these subjects were consistently identified as noncompliant during the first year's investigations, two were consistently identified as compliant, and two were "borderline" noncompliant. During the school year several subjects had to be dropped from the study for a variety of reasons (e.g., teacher withdrawal, family moves, alternative placements). Additional subjects were added during the project to provide sufficient data but none of the added subjects had participated during the first year.

Before data collection began, the UPAS was administered to all subjects by the project staff, and the teachers were asked to rate the subjects' compliance.

The code developed during the first project year was revised and used to record the behavior events using the M.O.R.E. system. Data collectors observed each subject for approximately an hour and a half each day and recorded teacher and pupil behaviors in response to compliance commands.

One hypothesis of the Compliance Project is that noncompliance interferes with (or at least obscures) the learning process with instructional targets as well as responsiveness to general classroom commands. Because the teachers were not running consistent programs for the subjects, project staff developed and ran a 15 to 20 minute instructional program daily with seven of the subjects. Time-based data were collected on each program and the data-based decision rules developed by the Instructional Hierarchies Research Project (Norris G. Haring, Principal Investigator) were used to make instructional modifications as needed (see Appendix C). The decision rules included suggested strategies for dealing with noncompliance, and project use of those strategies served as verification of their effectiveness.

### Summary of Second-Year Results

The following discussion of results from the preliminary analyses is organized according to the original hypotheses outlined earlier.

### H1: Prevalence of Noncompliance

Initial prevalence figures of noncompliance exceeded those originally expected. In fact, some teachers were identifying all of their students as noncompliant. Nominations by the research staff, based on more formal observations, were generally lower, but still frequently exceeded the original estimate of 33% by as much as 20 or

25%. However, all initial nominations were based on the response of students to general classroom commands involving behaviors which were believed to already be in their repertoire. When instructional programs were instituted by the research project with a sampling of individuals presumed to be noncompliant, nominations for noncompliance based on daily performance patterns alone resulted in a figure much closer to that originally hypothesized (i.e., 35-40%).

### H2: Identifying Noncompliance on the basis of Daily Variability

Daily instructional programs were conducted by the research staff with 7 of the research subjects. Generally, there was a high level of agreement between nominations for noncompliance made on the basis of general class data and nominations made on the basis of instructional data, but two individuals identified as "definitely noncompliant" on the basis of general classroom observations were not so identified on the basis of analyses of daily variability in instructional programs. Of course, on the basis of those data alone, it would be impossible to determine which set of nominations were more "accurate." In accord with the functional orientation of the Compliance Project, decisions were ultimately based upon an analysis of the extent to which the classification of an individual as noncompliant facilitated the identification of procedures which were effective in achieving higher levels of student functioning.

### H3 & H4: The Selection of Effective Remedial Strategies

Following the nomination of individuals as noncompliant on the basis of instructional data, interventions designed in accord with hypotheses concerning strategies which should be effective with noncompliance were implemented with three students in a total of seven programs. A total of nine interventions were also implemented with the six students identified as compliant; each of those interventions being designed in accord with hypotheses concerning what should be effective with compliant students. All interventions were at least partially successful in remediating observed performance deficits. Three of the seven interventions for noncompliance resulted in complete attainment of program objectives, and six of the nine interventions for compliant pupils resulted in complete attainment of program objectives.

Preliminary analyses of general classroom interaction patterns also supported hypotheses concerning noncompliance and the variables which might affect noncompliance. In classrooms where noncompliance appeared to be most prevalent, for example, it appeared common that:

1) Teachers had a low rate of issuing compliance requests; the rate of requests appeared lowest with pupils identified as noncompliant;

2) Teachers tended to repeat commands frequently, rather than to provide the pupil with more immediate consequences for noncompliance;

3) Compliance was rarely consequated (positively); noncompliance was rarely consequated (negatively); and frequently the consequences for both noncompliance and compliance were strikingly similar;

4) Allowable latencies between initial request and the initiation of compliance was frequently very long (e.g., 10 seconds or longer).

During the latter part of the 2nd project year, participating teachers were provided with summaries of their interaction data and asked to pick one or more of the following strategies for implementation with those pupils considered to be noncompliant:

1) Increase the rate of commands given to noncompliant pupils;

2) Decrease the allowable latency between initial request and the initiation of compliance with the request;

3) Eliminate repetition of requests or commands;

4) Increase the differentiation between consequences for compliance and noncompliance.

All of the recommended strategies were selected based on the assumption that the pupil had, indeed, acquired the behaviors being requested and that he/she simply needed greater incentive to display those behaviors in a consistent fashion. All suggested strategies were easily integrated with general classroom commands.

### H5: Impact of Compliance on Overall Development & Level of Functioning

UPAS data collected during the first project year showed an interesting relationship between nomination as noncompliant and overall level of functioning: no pupil achieving an overall score on UPAS of 50% or more was ever perceived as noncompliant. UPAS assessments conducted during the second project year showed more overlap, but children seen as noncompliant still tended to function (or, perhaps more accurately, appeared to function) at a lower level than their compliant peers. Eight instructional changes were made to remediate compliance problems as identified by the data decision rules. All of the changes resulted in increased progress either through an abrupt upward change in the level of corrects or in an upward shift in overall rate of progress.

### Project Products

Dissemination of the project's activities and preliminary results was accomplished through presentations and professional publications. The project staff presented findings from the first and second project years at the Eighth and Ninth Annual Conferences of the Association for the Severely Handicapped in New York, New York (October, 1981) and in Denver, Colorado (November, 1982). Ms. Munson was invited to McQuarie University in Sydney, Australia in April 1982 and gave three presentations on the Compliance Project to students, teachers and other professionals interested in the severely handicapped.

## 4.0 THIRD PROJECT YEAR: FY 82-83

### General Activities

The following represents a brief overview of activities undertaken during the third project year. The outcomes of each major activity will be summarized later in this report.

### First Quarter, Fall, FY 82-83

First quarter activities centered primarily around requirements for general project initiation. Staff were hired and trained, district administrators and teachers were consulted to establish basic working relationships, and subjects were selected.

It was agreed that project personnel would: (1) "team teach" with two regular classroom teachers when 6 of the 13 subjects were in their room (all subjects moved through several classes each day); (2) assist in the development of specific instructional plans from IEP objectives (at least one program for each pupil would be precision-teaching based, additional programs would be devised for each subject as the year progressed); and (3) monitor the programs and performances of all subjects ($n$=13) in at least two different program settings for each subject.

"Baseline" performance of each subject was assessed in three different ways: (1) the Uniform Performance Assessment System (UPAS), a curriculum-referenced instrument developed for use with handicapped populations; (2) teacher and project staff subjective ratings of each subject's compliance (see the second year annual report for a detailed description of how such ratings were conducted); and (3) direct observation of subject compliance. Direct observations were conducted with microprocessor observation and recording equipment (M.O.R.E) and monitored teacher/pupil behavior surrounding requests for the subjects to perform behaviors known to be in their repertoire. Such behaviors were identified through consultation with each subject's teachers.

### Second Quarter, Winter, FY 82-83

General compliance observations were continued with all subjects and at least one Precision-Teaching based program was implemented with each of the 6 primary experimental subjects. Non-Precision-Teaching programs were also monitored to assess their procedural reliability and subject performance. It was hypothesized that noncompliance during PT based programs would decrease (relative to baseline levels and in comparison to concurrent non-PT programs), with some possibility of generalized effects on noncompliant behavior outside of the PT program situation. The results of those studies will be discussed below.

### Third Quarter, Spring, FY 82-83

Specific studies were implemented during the third quarter to investigate the impact of various interventions on noncompliant behavior outside instructional programs per se. Specifically, two subjects were selected for a study of the relationship between teacher praise (for compliant behavior) and general subject compliance. The results of those studies will be discussed below.

### Fourth Quarter, Summer, FY 82-83

Studies during the Summer were restricted to the Experimental Education Unit at the University of Washington -- the only site providing a Summer program. Three subjects were studied in a multiple baseline design to determine the effects of two treatment alternatives on general compliance (i.e., compliance both within and outside instructional programs per se): (1) praise for compliance and a "mandate" (full physical assistance) for noncompliance or a failure to comply within 3 seconds of the initial request; and (2) repeated mandates for a failure to comply within three seconds. "Repeated mandates" involved repeating the request-(3 second pause)-physical guidance cycle until such time as the subject complied to the request within three seconds.

The results of all studies for the entire year were also summarized during the fourth quarter in preparation of the final report.

## Project Staff

Renee Beebe, who had worked as senior research assistant since the inception of the project, was advanced to the position of project manager. The previous project manager, Ms. Robin Munson, left the project in order to enter a doctoral program.

One full-time research assistant and two half-time research assistants were hired to assist Ms. Beebe in the conduct of project activities. All assistants were trained by Ms. Beebe in the use of the M.O.R.E system for the collection of project data, and in the use of Precision Teaching procedures for recording, charting and evaluating data. A detailed description of the training procedures may be found in the second annual report; overviews of the M.O.R.E system and observational codes may be found in Appendix A.

## Subjects

In cooperation with participating administrators and teachers in the Seattle School District and the University of Washington Experimental Education Unit, a total of 13 subjects were selected for study during the third year. Initially, all subjects had been nominated by their teachers as being of at least questionable compliance. Table 1 provides an overview of basic subject characteristics.

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## Working Arrangements

Arrangements were made to observe all subjects in a variety of classroom settings (i.e., to follow subjects as they moved from one class to another, for those that did so). Special arrangements were made to work directly with the subjects in group "B" (in the Seattle School District) in cooperation with the two teachers regularly assigned to work with those pupils. Project staff worked in that classroom for circa two hours each day.

## Table 1: Experimental Subjects

| Sbj# | (1) Site | Sex | (2) Grp | Yrs Age | (3) UPAS | (4) RTNG | (5) Diagnostic Categories |
|---|---|---|---|---|---|---|---|
| 3402 | SEA | M | E | 13 | -- | 1.83 | Severely retarded, deaf-blind |
| 3403 | SEA | M | E | 16 | 15 | 1.28 | Severely retarded, deaf-blind |
| 3404 | SEA | F | E | 12 | 7 | -- | Severely retarded, multiply-handicapped |
| 3903 | EEU | M | E | 13 | 19 | 2.20 | Severely retarded, multiply-handicapped |
| 3904 | EEU | F | A | 7 | 34 | 2.30 | Severely retarded |
| 3905 | EEU | F | A | 12 | 16 | 2.20 | Severely retarded |
| 3701 | SEA | F | B | 16 | 63 | 2.44 | Moderately retarded |
| 3702 | SEA | M | B | 13 | 33 | 1.67 | Severely retarded, visually impaired |
| 3706 | SEA | F | B | 14 | 53 | 2.27 | Severely retarded, hearing impaired |
| 3707 | SEA | M | B | 14 | 35 | 1.70 | Severely retarded |
| 3708 | SEA | F | B | 12 | 46 | 2.40 | Severely retarded, hearing impaired |
| 3709 | SEA | M | B | 15 | 43 | 2.09 | Severely retarded |
| 3710 | SEA | F | C | 16 | 45 | 1.67 | Severely retarded |

(1) EEU refers to the University of Washington Experimental Education Unit; SEA refers to Seattle Public School District. All subjects during the third year within the Seattle Public School District were located at Wilson-Pacific School.

(2) Subjects noted as being in group "B" were all scheduled to be in the same room during at least one two-hour period each day.

(3) UPAS (Uniform Performance Assessment System) is a curriculum-referenced assessment instrument suitable for the evaluation of overall levels of development in severely/profoundly handicapped persons. The first UPAS (UPAS1) was administered in early November of the third project year. Information concerning a subsequent administration of UPAS will be discussed later in this report.

(4) Compliance ratings (RTNG) were based on a 5 point scale (where 0 = "never complies with request" and 4 = "always complies with request") completed by each subject's teachers (subjects had one to three teachers; in cases where more than one teacher rated a subject, the median rating is reported above). Teachers rated subject compliance a total of four times during the 1982-83 school year (approximately once every two months). Only the first (entry-level) compliance rating is reported in this table. Remaining ratings will be discussed later in this report.

(5) Information concerning diagnostic categories were drawn directly from subject files and were established in accord with State of Washington Rules and Regulations.

The project manager served as instructor in selected programs for research subjects, and assisted in the development of instructional plans for IEP objectives for those subjects. Generally, at least one Precision-Teaching based program (i.e., a program employing rate-based performance data, standard behavior charts and performance-based decision rules) was conducted with each subject with additional Precision-Teaching based programs added as the year progressed. Non-Precision-Teaching based programs were also conducted in whatever manner designated by the subjects' teachers. In all cases, time-based data (i.e., rate, latency and/or duration measures) were collected to enable direct comparison of pupil progress in Precision-Teaching and non-Precision-Teaching programs.

Each subject's teachers compiled a list of compliance stimuli (i.e., commands or requests for behaviors which are known to be in the subject's behavioral repertoire, but to which the subject may not reliably comply). In cases where behavioral descriptions were not sufficiently objective or precise to enable reliable observation, project staff revised descriptions and checked those revisions with the teachers to ensure their accuracy. All compliance commands for each subject were memorized by project staff; subsequent compliance data (see discussion later in this report) pertained only to requests for behaviors previously identified as targets for compliance commands. A sample of compliance commands for each subject may be found in Appendix B of this report.

## General M.O.R.E. Observation Procedures

Data concerning general subject compliance to teacher requests/commands began early in October, 1982.

### Codes/Equipment.

All data were collected using the M.O.R.E. (Microprocessor Operated Recording Equipment) in a manner which enabled the following information to be recorded:

-- the time when a compliance stimulus occurred;
-- the time when the subject began to respond (if ever) to the compliance stimulus;
-- the quality of the subject's response (correct/incorrect) and the time when that response was completed (if not "instantaneous" upon initiation of response);
-- the manner in which a request for compliance was terminated, if other than by independent subject response (e.g., teacher mandating the response);
-- behaviors emitted by the subject other than the requested behavior (e.g., self-stimulatory behaviors, saying "no," crying); and
-- behaviors emitted by the teacher after the initial request/command and/or after the completion of the trial (e.g., praise, repetition of command before subject complies).

In each case, both the type and time of the subject and/or teacher behavior was recorded. All times were recorded to the nearest one-second. A complete description of the M.O.R.E. system and project codes may be found in Appendix A of this report.

### Observation Schedules.

Observation times were determined by the school schedule, teachers' preferred hours and willingness to allow access to their classrooms, and data collectors' hours and schedules. Within those constraints, an attempt was made to observe each subject assigned to the primary experimental classroom (group "B" at the Seattle School District Site) a minimum of four times each week in at least two different settings. Those six subjects were observed approximately two hours per week. The three subjects located at the Experimental Education Unit were observed two or three times each week (decreasing somewhat during Spring Quarter due to a reduction in available observer time) for a total of one to one-and-one-half hours per week. The four Seattle-based subjects not assigned to the primary experimental classroom were each observed one or two times each week for a total of circa one hour per subject per week. In all cases, priority was given to subjects known or believed to be noncompliant, and attempts were made to observe subjects during times when the number of general compliance commands would normally be the highest.

During any given observation period, observers collected data on a given subject for a period of 5 to 10 minutes, then rotated to another subject. The order in which subjects were observed was determined by the probability of compliance commands (e.g., observation of one subject might be terminated when the subject was engaged in an activity where few or no compliance commands would be given; the subject who was most likely to receive a number of compliance commands within the next 5 to 10 minutes would be selected next for observation). Random selection of subjects for observation (or, alternatively, a preset schedule for subject observation) would have yielded a more accurate picture of the overall rate and density of compliance commands per se. However, data from earlier years demonstrated that such procedures would not yield sufficient compliance-opportunities for meaningful analysis. In general, therefore, observations were conducted in a manner which attempted to maximize the data pertaining to compliance _per se_ for each subject.

### M.O.R.E. Reliability.

Interobserver agreement checks were conducted at least once each week in each classroom or with each group of subjects. Reliability checks averaged one to two hours in length, yielding an average of circa 5.5 hours of reliability data each week throughout the project.

Each reliability check involved only two observers, but such checks were rotated among three different observers to assess all possible observer combinations (i.e., observer 1 with observer 2, 1 with 3 and 2 with 3). When necessary (e.g., as might be the case when an observer was ill), the project manager served as the second observer for reliability checks. When a pair of observers were scheduled for a reliability check, one person acted as primary observer and determined the order in which subjects would be observed, indicating to the second observer (usually by gesture) whenever the observation target changed. The two observers stood in different areas of the room -- far enough away to prevent each other from determining which codes were being entered, but close enough to allow reasonable observation of the same subjects and to unobtrusively communicate when observation targets changed. Covert and unscheduled reliability checks were not possible, due to the manner in which observation targets were changed and rotated during any given observation.

Two types of reliability were calculated -- content (i.e., the degree to which two observers coded the occurrence of the same behavior) and temporal (i.e., the degree to which two observers, given that they record the same behavior, recorded the behavior as occurring at the same moment in time). Agreement scores were calculated as:

Level of Agreement = (agreements*100)/(agreements+disagreements);

A content agreement was counted whenever the two observers recorded the same behavior within the same pretrial/trial/posttrial period (regardless of differences among observers as to how long those periods were); content disagreement was coded whenever the two observers each coded different behaviors and/or one observer included a code which the other observer did not include within a particular pretrial/trial/posttrial period. There were two exceptions to those rules.

First, if a response was begun and completed very quickly (i.e., duration of response was less than one second), observers recorded only an "outcome code" to indicate whether the response was correct or incorrect. If a response took more than one second to complete after it was initiated (e.g., "hang up coat"), then observers coded "begin" when the response was initiated, and an outcome code (indicating correct/incorrect) if and when the response was completed. Since behaviors of short duration might reasonably be coded with separate "begin-end" codes by one observer and a simple "end" code by another, only completion codes were used in the analysis of content reliability. Differences in the use of "begin" codes were evaluated as part of temporal reliability.

Second, for purposes of a special analysis (discussed later in this report), "appropriate praise" codes were defined as teacher/manager praise following within five seconds of the completion of a correct response to a compliance request/command. Agreement with respect to such events was evaluated using KAPPA on "occurrences/nonoccurrences." Occurrences were defined as any instance in which both observers coded "teacher praise" within five seconds of a correct pupil response; nonoccurrences were defined when both observers did not code teacher praise within five seconds of a correct pupil response. KAPPA then reflects the proportion of agreement (with respect to occurrence or nonoccurrence) relative to the number of agreements one would expect to occur by chance (based on marginal distributions). A KAPPA of +1.0 will obtain when both observers agree exactly on occurrence/nonoccurrence and where there is at least some variation in coding (i.e., at least some occurrences and some nonoccurrences coded); a KAPPA of zero indicates that observers agreed with one another only as much as might be expected by change (on the basis of marginal distributions), and a KAPPA of -1.0 indicates a perfect "disagreement", as would be the case if each time one observer coded an occurrence, the other coded a nonoccurrence, and at least some of each type of code (i.e., some occurrences and some nonoccurrences) were observed by each observer. Basically, then, KAPPA describes the degree to which agreement among observers meets or exceeds the agreement one might expect by chance.

Overall content agreement ranged from 61% to 100%, with a mean of 88%. Agreement on "appropriate praise" coding (using KAPPA) ranged from +.56 to +1.00, with a mean of +.83.

Temporal agreement was counted whenever the M.O.R.E. recorded time for two identical codes matched exactly (the M.O.R.E was set to record times truncated to the whole second). Temporal disagreement was counted whenever recorded times for two identical codes differed.

Temporal agreement scores ranged from 33% to 100%, with an average of 76%. Relatively low temporal agreement was, undoubtedly, partially a function of at least two factors other than a failure of observers to accurately identify behaviors and to quickly code them into the M.O.R.E. First, as entry times were truncated by the M.O.R.E. equipment to the next lowest integer value of seconds, observers could differ by some arbitrarily small amount and still appear to differ by one whole second. That is, one observer could enter a behavioral code just prior to the advancement of the M.O.R.E.'s internal clock and another observer could enter the same code just following the advancement of the internal clock, resulting in an apparent difference of recording times as one whole second. Secondly, differences in entering codes other than the one being evaluated could result in some alteration in the timing with which the code being evaluated was entered. For example, if one observer coded "teacher prompt" just prior to the end of the trial an the second observer did not (i.e., an error in content reliability), the observer who coded the praise might be delayed somewhat in entering the "trial end" code (i.e., where content reliability exists and temporal reliability is being assessed). To allow for such problems, agreement to within one second was also calculated (i.e., agreements could be counted if observers differed in time by no more than one second, as recorded by the M.O.R.E. system), and overall temporal agreement increased to an average of 88%.

## Procedural Reliability

In addition to the collection of data-collection reliability, project staff also collected information concerning the degree to which instructional programs or interventions were implemented according to plan. Basically, each instructional program (whether devised by the project staff or not) was described in a detailed written plan which explained: (1) when the program was to be conducted; (2) who was involved; (3) program setting and general materials; (4) antecedent events, cues or prompts used to initiate responding and the schedule for using such events; (4) the specific behaviors or movements which the subject might make (either correctly or incorrectly); and (5) the consequences for correct and incorrect behavior and the schedule for their use. An observer, provided with a description of the plan, would indicate which elements of the plan were followed and not followed during any given instructional setting. General elements of the program (e.g., setting, materials) were simply coded as "yes/no;" repetitious elements of the plan (e.g., the use of planned consequences) were coded as "correct/incorrect" for each occurrence or opportunity. Procedural reliability was then calculated as:

$$\frac{100 * (\text{number of correct occurrences})}{(\text{number of correct occurrences + number of incorrect occurrences})}$$

Procedural reliability checks were conducted at least once every circa two weeks for each program. Following each check, feedback concerning any deviations from the planned program were provided to the program manager (i.e., teacher or aide). While many programs, particularly those not devised or implemented by project staff, demonstrated poor procedural reliability when first implemented, overall procedural reliabilities for all programs averaged 80%. Deviations from planned procedures of special interest to the project will be discussed below.

## Results of Initial Observations

Observations revealed that the teacher responses most likely to follow compliance with a command were to simply issue another request for the same or a different behavior, or to begin attending to another student. Both of those responses could logically be considered "null consequences" for compliance. Teacher praise for compliant behavior (a consequence with at least some data to support its probable effectiveness) occurred only circa 20% of the time across all subjects and program managers. The most common teacher responses to instances of subject noncompliance were (in order of their incidence): (1) repetition of the request; (2) issuing a "threat" (e.g., "...if you don't...then I will...") -- threats that were rarely actually acted upon; (3) providing physical assistance in complying with the request; (4) physically mandating compliance with the request (i.e., an action similar to physical assistance, but delivered more abruptly and with sufficient force to guarantee rapid completion of the task). Data collected during the first two years of the project would suggest that only the last consequence, physical mandates, might prove to be an effective consequence for noncompliance in at least some cases. One teacher did use physical mandates rather frequently, but usually only after several seconds had passed since the last request and several additional prompts (request repetitions) had failed to produce the desired response. In sum, then, it did not appear that teachers or other regular program managers were employing consequences which might reasonably be expected to improve the compliance of subjects known to be noncompliant; and indeed, may actually be using consequences which could lead to the deterioration of compliant behavior over time.

## Effects of "Structured" Programs

It might be hypothesized that at least some noncompliance is due to poorly structured programs (i.e., programs which can shift from day-to-day and in which no systematic approach is employed for determining how the program might be refined to better meet the needs of the individual). To provide at least a partial test of that hypothesis, at least one Precision-Teaching program was implemented for each of the 4 experimental subjects who demonstrated the most consistent patterns of noncompliance. Such programs were characterized as: (1) targeting "functional skills" of immediate relevance to the subjects' daily lives; (2) following a detailed, step-by-step, written plan; (3) the daily collection of rate (or other time-based) data for monitoring pupil progress; and (4) the use of objective, performance-based data decision rules for determining when and how a program should be modified (see Appendix C for an overview of those rules).

Each of the subjects was also involved in at least one other instructional program devised by regular instructional staff. Observational data to date had indicated that such programs were characterized by: (1) less specific plans which left much more latitude for variation in conditions from day-to-day; (2) frequent unplanned changes in program procedures, often even several times within a given session; (3) infrequent planned changes in program procedures (i.e., although procedures tended to vary from day-to-day, they were in most cases not actually planned by program managers, at least as reported to the project staff); and (4) inconsistent approaches for monitoring pupil progress. If regular assessments were conducted in such programs, they tended almost exclusively to provide only accuracy data (i.e., percent correct trials) and were treated summatively simply to demonstrate that the skill had (or had not) been learned after a period of time, rather than as the basis for daily instructional decisions.

After four months of observation, it was concluded that the effects of "well structured programs" on generalized compliance was minimal. While compliance of subjects during the PT-instructional sessions per se did tend to be greater than that observed during non-PT programs, that compliance did not produce substantial changes in the rate of compliance outside of the instructional situation.

## Effects of All-Day Compliance Programs

Having determined that the implementation of reasonable procedures within the context of isolated instructional programs will not produce generalized changes in compliance (a finding consistent with studies conducted in previous years), two subjects were selected for involvement in "all-day" compliance programs. Teachers in classrooms 24 and 44 (i.e., the two classrooms with staff willing to participate in the study) were provided a list of possible compliance-related interventions, including stepping ahead to more difficult program levels, decreasing the allowable latency for compliance, and increasing the frequency and/or magnitude of consequences for compliance and/or noncompliance. The teachers were willing only to attempt to be consistent in providing praise when the pupil complied to a request within three seconds, delivering that praise within at least five seconds of compliance. Teachers continued to provide consequences for noncompliance as they had prior to the compliance intervention. That is, they did whatever "came to mind" at the time. There were no consistent responses to noncompliance either within or across teachers, but most often teachers simply repeated their request or command after a noncompliant response.

Data collected for a period of four months prior to intervention (October through February) indicated the following:

| Subject | Classroom | Mean Monthly % Compliance | Mean % Approp. Teacher Praise | |
|---|---|---|---|---|
| 3702 | 24 (A) | 65%-79.5% | 18.1%-35.4% | (Oct-Jan only) |
| | 26 | 67% | 0% | (Jan only) |
| | 42 | 55%-66.7% | 0%-33.3% | (all months) |
| | 44 (B) | 62%-100% | 0%-23.4% | (all months) |
| 3708 | 24 (A) | 54.2%-87.5% | 0%-0% | (all months) |
| | 26 | 100% | 0% | (Jan only) |
| | 44 (B) | 83.3%-97.1% | 0%-8.3% | (all months) |

Interventions (consistent praise for compliance) were then scheduled to begin in February for subject 3702 in rooms A and B, and in room A for subject 3708 (that subject was already considered acceptably compliant in room B).

Considerable difficulty was encountered in generating teacher procedural reliability in the use of praise following compliant behavior. By the end of February (after circa three weeks of "intervention") teacher praise had increased, but was still consistently less than 50%. By the end of March, even with feedback on consistency from project staff, teachers still averaged only 40% reliability in delivering praise following compliance, and the teachers reported difficulty in remembering the procedures for both subjects. Project staff then provided additional exemplars of how the praise should be delivered and continued to provide feedback concerning teacher reliability. By the end of April teachers were still averaging less than 50% reliability, so project staff provided direct models (with the experimental subjects) and immediate feedback to teachers following individual compliance trials. Until that time, no substantial or consistent change in subject performance was observed, despite moderate increases in the frequency of teacher praise. By the beginning of May, the teacher in classroom A had achieved an all-time high of 76% reliability in the implementation of the procedures with subject 3702, and that subject's performance rose to an average of 87% compliance in both classroom A and classroom B. The intervention for subject 3708 was never implemented reliably (i.e., at a level consistently above 50%) and no change was observed in that student's behavior. In the middle of May teachers were instructed to stop praising student 3702 for compliance (a procedure which they had no difficulty in following), but no decrement in that subject's performance was observed during the next few weeks (i.e., before school terminated for the year). Individual charts for the two subjects may be found in Appendix D of this report.

Put simply, the results of the "all-day compliance program" studies were difficult to interpret. Although baseline data generally indicated patterns of noncompliance, "peaks" in performance were observed for both subjects into regions which would generally be considered acceptable levels of compliance over periods of several days or weeks at a time. Teacher praise during baseline was generally low or nonexistent, but what variation was observed did not consistently relate to concurrent levels of pupil compliance. For that reason alone, the project staff would have preferred to test interventions other than consistent teacher praise (or, at least, in combination with praise), but could not gain consent from the persons who would have to be responsible for implementing the intervention.

The integrity of the study was further compromised by a failure to achieve reasonable levels of procedural reliability within a short period. Overall levels of teacher praise did improve markedly shortly after the intervention was scheduled to begin, but not to levels which could reasonably be considered "reliable and consistent." When minimally acceptable levels of teacher praise were achieved by one teacher in one class, subject performance improved not only in the classroom where praise was delivered consistently, but also in the classroom where it was not being delivered consistently. That sort of generalized effect is, of course, desirable, but in the context of that particular study, it also suggests the possibility of some unknown historical confound.

Finally, a withdrawal of the praise failed to produce any notable decrease in the subject's compliance. Again, while such maintenance is desirable from an educational standpoint, support for the hypothesis that the behavior changes were dependent upon teacher praise was not achieved.

Overall, therefore, the following conclusions were drawn: (1) at least some teachers of the severely handicapped do not consistently praise compliant behavior in pupils known to be generally noncompliant; (2) such teachers may find it quite difficult to institute a program of consistent praise for compliance, even when provided regular feedback concerning their efforts to do so; (3) achieving reasonable levels of consistency in praising students for compliant behavior (i.e., 75% reliability or greater) may result in substantial increases in subject compliance which generalized across specific managers and settings, but such an effect has not been convincingly demonstrated.

## The Effects of Mandates and Repeated Mandates on the Frequency of Compliant Behavior

A cross-subject multiple baseline study was conducted with three consistently noncompliant subjects located at the Experimental Education Unit to determine the effects of mandates and repeated mandates delivered as consequences for noncompliance. Each subject was exposed to three conditions:

Baseline. During baseline the regular instructional staff responded to instances of noncompliance in whatever manner they wished. Such responses most frequently took the form of repeated requests to comply, physical assistance, or ignoring the noncompliance and not requiring the subject to perform the desired task. Occasionally managers would mandate compliance (i.e., abruptly guide the subject through the task with sufficient force to guarantee its quick completion), but were inconsistent in doing so and/or did so only after trying repeated requests or other prompts first.

Mandate & Praise. Following the establishment of a reasonably stable baseline, managers began to consistently consequate compliance with teacher-praise and noncompliance with an immediate mandate (as defined above). In order for a response to be classified as "compliant" it had to occur within three seconds of the initial request to perform a task; and in order for teacher praise to be considered an appropriate consequence, it had to follow the completion of a correct response within three seconds. (Note: in retrospect, both allowable time limits may have been too long. See the section on Latency Analyses, below.)

Repeated Mandates + Praise. After establishing the impact of a single mandate following noncompliance, subjects were exposed to a contingency in which managers would repeatedly mandate a correct performance until a correct response was performed independently. The procedures were as follows: (1) issue initial request; (2) if no correct, independent, response is observed within 3 seconds, mandate the correct response and (if necessary) return the subject to the position or condition which originally existed (i.e., the condition which existed prior to the original request); (3) repeat the request for the same (independent) behavior; (4) repeat steps 2 & 3, above, until a correct, independent response occurs within a 3 second latency. In essence, subjects had to comply to each request with an independent response within a 3 second latency in order to terminate the sequence. The only question was whether that compliance would occur following the initial request, or some repetition of the request following a mandated trial. Teacher praise for correct responding to an initial request was continued as described for the previous phase (see above). Feedback for eventual compliance in a series where mandates were required was limited to a simple statement of acceptability (e.g., "that's right").

Under the single-mandate approach the pupil could effectively avoid doing any particular task by simply not complying with the request. Although that noncompliance might result in some negative consequence (e.g., time out, a physical mandate), independent completion of the task could be avoided. Under the "repeated mandate" approach the pupil could not avoid independent completion of the task. Based on the assumption that task-avoidance might be a reinforcing condition to a noncompliant pupil, it was hypothesized that the repeated-mandate condition would prove more effective than the single-mandate condition.

Each subject was exposed to each successive intervention in a staggered manner in an attempt to control for possible historical confounds. Unlike earlier investigations in other classes, program managers quickly achieved a minimum of 80% reliability in the implementation of each procedure.

The results of the study (see Appendix E for individual charts) indicated that the first intervention (praise for corrects & a single mandate for errors) had little or no positive effect on compliance or day-to-day variability in compliance. One subject showed a clear improvement in compliance to initial requests under the "repeated mandates" condition, achieving levels of compliance ranging from 58% to 83%. Prior to the repeated mandate condition, that subject had achieved compliance scores above 50% on only circa 23% of the days studied. The effects of repeated mandates on the remaining two subjects were less dramatic. Although one subject did achieve higher levels of compliance under the repeated mandate condition than in previous conditions, those higher levels of compliance might simply have been the extension of previously established performance trends. Finally, the overall compliance of the third subject under the repeated mandate condition was not noticeably higher than that achieved in earlier conditions. Indeed, based upon a trend analysis, one might conclude that the third subject's level of compliance under repeated mandates was inferior to that which might have been expected if the subject had been left under baseline or single-mandate conditions. It was possible to undertake only four days of repeated-mandate instruction prior to summer break, however, so the immediate results obtained with the third subject are equivocal in all respects.

An analysis of the number of mandates required to produce independent responding produced more encouraging results. When the repeated mandate condition was first introduced, all subjects required an average in excess of ten mandates per request before performing the task independently (medians over the first three days for the three subjects were 26.14 mandates/trial, 17.11 mandates/trial and 17.42 mandates/trial). Median mandates/trial over the next three days dropped to 3.8 and 5.18 for the two subjects who were in that condition for at least six days, and the subject exposed to the condition for only four days had dropped to an average of 7.83 mandates/trial by the fourth day. In other words, all three subjects demonstrated progress toward independent responding in fewer trials under the repeated-mandate condition.

Only two subjects returned to the experimental classroom following summer vacation (a break of circa 6 weeks). The repeated mandate condition was continued with those two subjects, with encouraging results. Median levels of compliance (to first request) rose and stayed consistently above 80% (a level most commonly mentioned as acceptable in the research literature), and although the number of repetitions required to achieve independent responding on noncompliant trials had occasional "peaks," the trend for mandates/trial for both subjects generally decelerated over time. By the end of the study, each subject required correction on zero, one, two or three three trials per day, and the median number of repeated mandates required to produce independent responding when the subject did fail to comply to the initial request had dropped to between two and four.

Overall, therefore, the use of repeated mandates to improve the compliance of severely handicapped students would appear to be a promising approach. Given the extensive history of noncompliance with all the subjects studied, and the high levels of compliance achieved by the end of the study, the effort involved in such an approach would appear justified. The effort to implement such a procedure cannot be overlooked, however. All subjects "tested" the contingency on several days, often requiring several hundred repeated mandates for a given request before performing independently. It would appear also that at least two weeks must be allowed before clear effects of the intervention can be expected. Program managers must be prepared to "stick with it," therefore, if the long-range benefits of the intervention are to be realized.

## Latency Analyses

A cursory examination of IEPs and instructional plans in classrooms involved in the study reveals that most teachers either do not mention allowable latencies in their objective statements (i.e., they do not state how long they will wait for a response to occur) or they establish allowable latencies of five seconds or longer. In a survey of the published literature pertaining to the instruction of the severely handicapped (n=20 studies), only 80% of the studies specified allowable response latencies, and the median latency mentioned was five seconds (range = 3 seconds to 30 seconds). Several considerations might argue for much shorter allowable latencies.

First, the effects of consequation are generally diminished in proportion to the length of delay between the occurrence of a behavior and the delivery of the accelerating/decelerating consequence. In many cases a "failure to respond appropriately" is accompanied by other undesirable behavior (e.g., self-stimulation, looking away). Delay of feedback for that inappropriate behavior might, therefore, reduce the effectiveness of the program in dealing with such problems.

Second, to the extent that avoidance of task is a reinforcing event for a pupil, delay of feedback for failure to respond may increase the reinforcing properties of the interaction.

Third, formation of discriminative stimulus properties is generally a function of the degree to which two stimuli are consistently paired in close temporal proximity. Given that one wishes a simple request (e.g., "come here") to acquire discriminative properties (e.g., coming will result in praise; failure to come will result in a mandate), the feedback (praise or mandate) should follow the original request very closely in time.

Earlier studies have, indeed, suggested that relatively small allowable latencies are likely to result in improved performances, especially with noncompliant pupils (c.f., Haring, Liberty & White, 1980). As a further investigation of that issue, however, the latency data collected during the course of the compliance studies were evaluated to determine whether there was any consistent relationship between latency of response and the probability of compliance or noncompliance.

The latencies of ten subjects over a period of thirty-five weeks were studied. In all, 3475 latencies were recorded during that period, ranging from 61 latencies for the least studied subject to 1174 latencies for the most studied subject. Correct responses were recorded for 2366 of those trials, with 1109 incorrect, mandated or aborted trials. (See Appendix F for group and individual performance records).

The absolute probability of correct responding was found to diminish very rapidly as a function of response delay (latency). Circa 55 percent of all correct responses to compliance requests occurred within one second of the initial request, whereas only circa 27 percent of all errors occurred within the same period; and circa 80% of all correct responses occurred within three seconds of the initial request, as opposed to only 55% of the errors. The remaining 20% of the correct responses were distributed over the next 27 seconds (i.e., between 3 and 30 seconds). Curves for all individual subjects follow the composite curve for all subjects very closely.

The relative probability of correct responding, when held in contrast to errors, demonstrates that responses occurring in less than one second have a .98 probability of being correct, and that the probability that a response will be correct drops dramatically to circa .72 by the end of three seconds. Again, the performance records for all individual subjects closely follows the composite for all subjects.

The median latency for correct responses over a period of 35 weeks ranged between one and two seconds, whereas the median latency for error responses ranged from one to 9 seconds over the same period. Median error latencies were as low as or lower than correct latencies during only 6 of the 35 weeks studied. Moreover, despite general trends up or down in individual subject levels of compliance during that period, no trend is observable in median correct or error latencies. That is, even when subjects became more or less compliant overall, their average correct/error latencies remained relatively stable.

As a result of those analyses, it was concluded that there is little reason to wait more than a few seconds for a pupil to respond to a compliance request. The vast majority of correct responses will occur within 1-3 seconds, if they occur at all, and the longer one waits, the higher the relative probability that the response (if and when it is emitted) will be incorrect.

# APPENDIX A

## M.O.R.E Observation Codes

# OBSERVATION CODES
August 1982

## STARTING CODES

| | |
|---|---|
| 11 | STIMULUS/COMMAND |
| 12 | STIMULUS/COMMAND WITH PROMPT |

## LATENCY CODE

| | |
|---|---|
| 31 | PUPIL BEGINS RESPONDING |

## ENDING CODES

| | |
|---|---|
| 32 | CORRECT RESPONSE |
| 33 | INCORRECT RESPONSE |
| 34 | TEACHER MANDATES BEFORE PUPIL FINISHES (OR BEGINS) RESPONSE |
| 35 | OTHER EVENT INTERRUPTS RESPONSE (PARTIAL TRIAL) |

## PUPIL BEHAVIOR CODES

| | |
|---|---|
| 41 | SELF-STIMULATORY BEHAVIOR |
| 42 | SAYS OR INDICATES "NO" (REFUSES TO COMPLY) |
| 43 | INAPPROPRIATE SOCIALIZING |
| 44 | HITS OR FIGHTS |
| 45 | CRIES, SCREAMS, TANTRUMS, THROWS OBJECTS |
| 49 | STOPS ANY 41-46 BEHAVIOR |

## TEACHER BEHAVIOR CODES

| | |
|---|---|
| 51 | GENERAL PRAISE |
| 52 | TASK-SPECIFIC PRAISE |
| 53 | TOUCHES OR HUGS PUPIL WHILE PRAISING |
| 61 | GIVES OBJECT AND PRAISES |
| 71 | GIVES FOOD/DRINK AND PRAISES |
| 81 | REPEATS ORIGINAL STIMULUS/COMMAND |
| 82 | GIVES VERBAL OR SIGNED CUE |
| 83 | GIVES GESTURAL CUE |
| 84 | GIVES PHYSICAL PROMPT |
| 91 | SAYS "NO" OR "THAT'S NOT RIGHT" (VERBAL FEEDBACK) |
| 92 | STATES CONSEQUENCE TO PUPIL |
| 93 | LEAVES PUPIL AS CONSEQUENCE |
| 94 | MOVES PUPIL AS CONSEQUENCE (eg., TIMEOUT) |
| 95 | TEACHER/PUPIL RETURNS (CONCLUSION OF 93 OR 94) |
| 96 | MANDATES AFTER INCORRECT RESPONSE |
| 97 | MANDATES AND GIVES VERBAL CORRECTION |
| 98 | TAKES AWAY POTENTIAL REINFORCER (RESPONSE COST ) |

8-9-82

# RULES FOR CODING

## Stimulus/Command

*Codes 11, 12

Press appropriate keys immediately following command or stimulus

## Responses

*Code 31

Press keys at first sign of movement related to requested response.

*Codes 32, 33

Press keys immediately following completion of correct or incorrect response.

## Other Behaviors

*Codes 41, 42, 43, 44, 45

Code these student behaviors at the following times only: After the command is given if no other response is observed, and at completion of command-response chain. Do not code "other behaviors" if they occur simultaneously with student responses or teacher behaviors.

*Code 49

Code a 49 if a 41 - 45 has been coded previously and the student has stopped the "other behavior." (Do not use to indicate the cessation of a 42.) Again, commands, responses and teacher behavior take precedence over all 4 codes.

## Consequences

*Codes 51, 52, 53
61
71

Press appropriate keys immediately following delivery of the consequence. In the case of the 71, do not code until the food or drink is actually in the student's mouth.

*Codes 81, 82, 83, 84
91, 92, 93

Press appropriate keys immediately following observance of cues, prompts, or feedback.

*Codes 93, 94, 95

Press appropriate keys only after the event has occurred. For example: Code a 93 when teacher has left the student; not when it looks as though s/he might leave. Code a 94 after the student is actually in a time-out situation. In the same manner, code a 95 after the student (or teacher) has actually returned to the class.

*Code 96, 97

Code a 96 only after the teacher's assistance has been completed, and it is apparent that the student had no opportunity to respond on his/her own.

*Code 35

Enter a 35 immediately following the observation of an interruption of the stimulus-response chain.

# APPENDIX B

## Sample Compliance Commands for each Subject

B

Subj Number 1 Teacher ____

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| getting ready for recess or bus | "Get your coat." | puts on coat | moves toward coat room | coat is on | puts coat on floor |
| enters room in morning | no command | goes to desk; sits down in chair | moves toward desk | sitting in chair at desk | goes to play area or sits in wrong place |
| anytime | "Get something to do,"<br>or<br>"...from shelf." | goes to activity shelf, gets toy and returns to desk | begins to move toward shelf | sitting at desk with toy | goes to play area, gets toy, but doesn't go to desk |
| anytime | "Go to" or "Time for"<br>-circle<br>gym<br>bathroom etc. | goes to designated area in room or leaves room to go elsewhere | begins to move toward area or door | gets to area or enters hall | doesn't move within 5 sec. |
| getting ready to leave classroom | "Line up" | stands by door- usually behind teacher or another student | begins to walk to door | standing in line | stands beside peer or teacher |
| anytime sitting | "Stand up." | stands up - may hold on to manager's arm | swings legs around to stand | standing | -no error response- teacher will mandate |
| anytime standing | "Go to seat." | goes to desk and sits down in chair | begins to walk toward desk | sitting at desk | goes to wrong place |
| coat on hook in coatroom | "Pick up coat."<br>(with gesture) | takes coat off hook | moves hand to coat | coat off hook in hand | drops coat |
|  |  |  |  |  |  |

SUBJ[illegible] NUMBER _ TEACHER _

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| Anytime | "stand up" | Stands up | Positions legs to stand. | Standing | Does not mov within 5 sec. |
| Enters P.E. room | "Sit on the mat." | Sits on the mat. | Walks towards mat. | Seated on mat. | Does not move, does not sit. |
| After Standing from mat in PE room | "Find your spot." | Walk to assigned 'x' on floor. | Starts toward 'x'. | Stands on 'x' | Does not move within 5 sec. |
| Pants wet- need changing. | "Take off your pants." | All clothing from waist down removed. | Unsnap pants | All clothing removed | No movement within 5 sec. |
| After removal of wet, soiled pants | "Put on your pants." | All clothing from waist down put on. | Picks up under-pants. | All clothing put on. | No movement-5 se |
| Anytime | "Come here"(designates where by pointing) | Moves to designated spot. | Begins moving toward spot | Reaches designated spot. | Does not move toward designated spot. |
| Preparing for exercise | "Arms up" | Puts arms out to side | Raises arms | Arms at side | Does not move w/in 5 sec. |
| Preparing for Exercise | "Hands on hips." | Places hands on or near hips | Begins to raise arms. | Hands on hips | Does not move w/in 5 sec. |
| Preparing for exercise | "Touch your toes" | Bends from waist and reaches towards toes. | Begins to bend | Arms stretched towards feet. | Does not move w/in 5 sec. |
|  |  |  |  |  |  |

SUBJ NUMBER TEACHER

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| Clothing in mouth | "Hands in pockets" | Hands placed in pants pocket. | Removes hands from clothing, mouth. | Hands in pockets | No movement within 5 sec. |
| Dressing program | "Do your zipper." | | | Zipper connected. | No movement in 5-sec. |
| Objects in mouth | says,"Not in mouth ." | Takes object from mouth. | Begins removing from mouth | Object out of mouth | Leaves object in mouth |
| | | | | | |
| | | | | | |
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Subject Number

Teacher

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | [illegible] |
|---|---|---|---|---|---|
| Anytime | Signed and verbalized "sit". | Sits down | Begins to sit. | Stands | Doesn't sit |
| Anytime | Signed and verbalized " stand ". | Stands up | Begins to stand | Sits | Won't stand |
| Anytime | Signed -verbalized "play"<br>(Sign by shaping playing actor) | Starts playing instrument. | Begins to shake or tap instrument | Stops playing | Won't play |
| Anytime | Signed and verbalized "No"<br>Take object out of mouth | Removes object from mouth | Begins to remove obj. from mouth | Puts Obj. back in mouth | Keeps object in mouth. |
| Anytime | Signed and verbalized "come" | Comes | Begins to follow | Stops walking | Stops going in proper direction |
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SUBJ[redacted] NUMBER TEACHER _ [redacted] ________ [redacted]

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| Prone on wedge on rug- Mgr. sitting facing her. | "Push ball" | Moves arm away from body contacting the ball. | Straightens arm at elbow | Contact with ball | Keeps arm bent longer than 5sec |
| Anytime head is not in harness | "Head up" | Raises head to mid-line | Begins to raise head | Head in mid-line | Head down longer than 5 sec. |
| When seated in wheelchai | "Hand down" | Lowers arm to tray or lap | Hand moves toward lap | Hand on tray or lap | Raises hand higher or does not put hand down in 5 sec. |
| When seated in wheelchai | "Give me your arm" w/ gesture | Raises arm to shoulder level | Arm moves upward | Forarm shoulder height | Moves arm in different direction |
| During music and going t the bus | "Wave Bye-Bye" | Raises arm to shoulder level. | Arm moves upward | Forarm shoulder height | Moves arm in different direction |
| Lunch time | "Hold the galss"<br>"Hold the .(.rattle) | Grasps glass or rattle presented to her | Moves hand to object | Grasping obj. | Does not move w/in 5 sec |
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Subject Number ______ Teacher ______

| Stimulus Condition | Command (verbal or signad) | Compliant Response | Starts | Stops | [illegible] Example |
|---|---|---|---|---|---|
| Anytime | Sign in hand "come" | Walks to designated area | begins to move | arrives at destination | Won't move |
| Anytime | Sign in hand "stand up" | Gets up | Begins to rise | Is standing | Doesn't move |
| Muisc class | Sign in hand "Work" | Plays instrument-<br>(Begins working) | Begins task | Finishes task | Throws work on floor. |
| Anytime | Sign in hand "sit" | sits | Starts to sit down | Remains seated | Won't sit down |
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SUBJ[illegible] NUMBER __ TEACHER _[illegible] ______

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| anytime | "stand up" | stands up | positions legs to stand | standing | does not move w/i 5 sec. |
| after standing from mat (P.E.) | "Find you spot" | Walk to assigned "X" on floor | moves toward "X" | stands on "X" | does not move w/i 5 sec. |
| anytime | "come here" (designates by pointing) | moves to designated spot | begins moving towards spot | reaches disignated spot | does not move toward designated spot w/i 5 sec. |
| enters P.E. room | "sit on Mat" | sits on mat | moves toward mat | sitting on mat | does not sit on mat w/i 5 sec |
| preparing for exercise | "arms up" | puts arms out to side | raises arms | arms at side | does not move w/i 5 sec. |
| preparing for exercise | "hands on hips" | Places hands near or on hips | begins to raise arms | hands on hips | does not move w/i 5 sec. |
| preparing for exercise | "touch your toes" | bends from waist and reaches towards toes | begins to bend | arms stretched towards feet | does not move w/i 5 sec. |
| anytime | "find your seat" | sits in chair | moves toward chair | seated in chair | does not move w/i 5 sec. |
| Enters room | "sit at the table" W/sign | Goes to table and sits | Moves toward table. | Is sitting at table | Doesn't move |
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Subject Number ______ Teacher ______ ______

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Non-Example |
|---|---|---|---|---|---|
| Anytime Standing | "Come" with sign. Designates area. | Moves near person speaking | Moves toward person | Arrives near person | Doesn't move |
| Anytime Sitting | "Stand Up" (with sign) | Stands | Begins standing | Is standing | Doesn't move |
| Anytime | "Point to..." (Requested obj. or person) | Points to requested obj. or person | Lifts hand | points to obj or person | Doesn't move |
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SUBJE[illegible] NUMBER ______ TEACHER ______

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| anytime | "stand up" | stands up | positions legs to stand | standing | does not stand w/i 5 sec. |
| Enters P.E. room | "sit on the mat" | sits on mat | moves toward mat | seated on mat | does not sit on mat w/i 5 sec. |
| after standing from mat | "find your spot" | walk to assigned "X" on floor | starts toward "X" | stands on "X" | does not go to "X" w/i 5 sec. |
| Preparing for exercise | "Arms Up" | Put arms out to side | Raisies arms | Arms at side | Does not move w/in 5 sec. |
| Preparing for exercise | "Hands on hips" | Places hands on or near hips | Begins to raise arms. | Hands on hips | Does not move w/in 5 sec. |
| Preparing for exercise | "Touch your toes." | Bends from waist and reaches towards toes. | Begins to bend. | Arms stretched towards feet. | Does not move w/in 5 sec. |
| Anytime | "Sit down" | Sits on a chair | Starts toward chair | Seated in chair | Does not move w/i 5 sec. |
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SUBJE NUMBER ___ TEACHER ___ ___________

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| Comes into PE room | "Sit on the mat" | Sits on her mat | Moves toward mat | Sits on her assigned spot | Wanders about room. Does not move w/in 5 sec. |
| Anytime | "Stand Up" | Stands up | Positions legs to stand. | Standing | Does not move. |
| Anytime | "Come here"(designates where by pointing) | Moves to designated spot. | Begins moving toward spot | Reaches designated spot | Does not move toward designated |
| 1:1 Program dressing | "Tie your shoe" | Uses right hand to cross laces | Picks up shoe laces | Laces are crossed. | Does not move w/i 5 sec. |
| Anytime | "Give me____." | Gives obj. requested | Extends hand w/ obj. Towards T. | T. can easily remove obj. from their hands | Keeps obj close to body-<br>No movement w/i 5 sec. |
| Preparing for exercise | "Arms Up" | Put arms out to side | Raises arms | Arms at side | Does not move w/i 5 sec. |
| Preparing for exercise | "Hands on hips." | Places hands on or near hips. | Begins to raise arms. | Hands on hips | Does not move w/in 5 sec |
| Preparing for exercise | "Touch your toes." | Bends from waist and reaches towards toes. | Begins to bend | Arms stretched towards feet. | Does not move w/in 5 sec. |
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SUBJ NUMBER ____ TEACHER ____ ________

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| Enters P.E. room | | sits on mat | moves toward mat | sitting on mat | does not sit w/i 5 sec. |
| anytime | "stand up" | stands up | positions legs to stand | standing | does not stand w/i 5 sec |
| anytime | "come here" (designates by pointing) | moves to designated spot | starts moving towards spot | reaches designated area | does not move to designated spot w/i 5 sec. |
| after standing from mat | "find your spot" | walk to assigned "X" on floor | moves toward "X" | stands on "x" | does not move to "X" w/i 5 sec. |
| preparing for exercise | "arms up" | puts arms out to side | raises arms | arms at side | does not move w/i 5 sec. |
| preparing for exercise | "hands on hips" | places hands on or near hips | begins to raise arms - | hands on hips | does not move w/i 5 sec. |
| preparing for exercise | "touch your toes" | bends for waist and reaches towards toes | begins to bend | arms stretched towards feet | does not move w/ 5 sec. |
| anytime | "sit down" | sits in chair | moves toward chair | seated in chair | does not sit w/i 5 sec. |
| Enters room | "Sit at that table." | Sits at designated table | Moves toward table | Sits at table | Doesn't move |

Subject Number ____________ Teacher ____________________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Non-Example |
|---|---|---|---|---|---|
| Enters room | "Sit at that table" | sits at designated table | Moves toward table | Sits at table | Doesn't move |
| Anytime | "Stop rocking" | Sits still | Sits still | sits still | Keeps rocking |
| Anytime sitting | "Stand up" | Stands | Begins getting up | Stands | Doesn't move |
| Anytime Standing | "Sit down" | She sits | Begins sitting | sits | Doesn't move |
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Subject Number ________ Teacher DAVE

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Exampl |
|---|---|---|---|---|---|
| - anytime Angie has hands cupped over/in her mouth | "Angie, Hands Down" | Angie takes hands down from her mouth w/in 3 sec. of cue | - visibly reacts to name being called (facial expression - visual regard)<br>- takes hands out of mouth | - lowers hands to below neckline | - makes no movement to remove hands from mouth<br>- does not remove hands from mouth and lower to below neckline w/in 3 sec. of verbal cue |
| - seated at table w/ cup in front of her on table | "Pick Up Cup" | picks up cup w/in 5 sec. of cue | moves right hand toward base of cup | grasps cup and lifts off table | - makes no movement to pick up cup<br>- stops or delays in the process of picking up the cup<br>- does not pick up cup w/in 5 sec. of verbal/visual cu |
| - seated at table during lunch or snack time<br>- spoon on table near plate | "Pick Up Spoon" | picks up spoon w/in 3 sec. of verbal/visual cue | moves right hand toward spoon | grasps spoon and lifts off table | - makes no movement to pick up spoon<br>- does not pick up spoon w/in 3 sec. of verbal/visual cue |
| - standing in front of chair w/ back facing chair seat<br>- mgr. provides physical assist at neck | "sit" | Angie bends, puts hand(s) on chair seat & sits on chair seat w/in 3 sec. of physical/verbal cue | bends at waist & knees | is seated on seat of chair. | - makes no movement to bend or sit<br>- "plops"<br>- does not put hands on seat<br>- does not sit w/in 3 sec. of physical/verbal cue |
| - sitting in chair<br>- mgr. places hands on seat, feet flat on floor & physical assist at neck | "stand" | stands up w/in 3 sec. of verbal cue | bends forward on seat of chair | stands | - makes no movement to stand<br>- removes hands from se<br>- does not stand w/in 3 sec. of physical/verbal c |
| - ascending or descending stairs<br>- mgr. provides physical assist to put hand on rail | cues right hand - descending<br>cues under left arm - ascending | steps down/up - w/ rt. foot [leg] w/in 3 sec. of cue | moves rt. foot forward | both feet on next step | - makes no movement to take a step<br>- does not step w/in 3 sec. of physical cue |
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Dave

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|---|---|---|---|---|---|
| Same | Angie,<br>"Hands Down" | Same | Same | Same | Same |
| | · Can a compliance "request" be instigated w/out a verbal command but mostly the appearance of a natural cue? i.e. placement of liquid in front of him | | | | |
| Same | If so,<br>Same | Same<br>w/in 3 sec | Same | Same | Same<br>w/in 3 sec. |
| Same | "Pick Up Spoon" | Same | Same | Same | Same |
| · no assisted neck · chair placed behind Angie touching back of legs | "Sit" | Same | Same | Same | Same |
| · no physical assist | Same | Same | Same | Same | Same |
| Same<br>· stands at top of stairs<br>- stands at bottom of stairs<br>· physical cue to place hand on rail [each step] | descends stairs<br>ascends stairs | initiates movement w/in 3 sec.<br>· steps down w/in 3 sec of independent hand placement on rail even w/ only downward<br>- steps up w/in 3 sec of physical downward assist and hand placement on rail at next step | Same | Same | Same<br>+ initiates movement but does not complete or return foot to same step. |

Subject Number ____ Teacher: D[illegible]

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| - coming into room in the morning; goes to coat rack<br>- coming into room from outside [playcourt]; goes to coat rack | "Coat off" | takes off coat w/in 5 sec. of cue | "drops" coat over shoulders | coat is off | - makes no movement toward removal of coat<br>- stops or delays in the process of removal<br>- does not remove w/in 5 sec. of command |
| - in bathroom, in front of toilet<br>- pants pulled down by mgr. over hips | "Pants Down" w/in 5 sec. of cue | ① pushes pants down to point below knees<br>② pushes under pants down to point below knees | puts hands on pants | pants are at a point below the knees | - makes no movement toward pushing down pants<br>- stops or delays in the process of pushing down pants<br>- does not lower w/in 5 sec. |
| - mgr. calls Evelyn's name;<br>- explains what is to be worked on<br>- positions at table next to chair | "Sit" | sits down in chair at table w/in 5 sec. of cue | places hands on table; bends at knees | is seated | - makes no movement toward sitting in chair at table<br>- stops or delays in the process of sitting<br>- does not sit w/in 5 sec. of command |
| - on playcourt<br>- peers have left or are departing | "Time To Go Inside" | makes movement toward voice or direction of mgr. and comes inside building from playcourt w/in 10 sec. of cue | moves toward voice or direction of Mgr. | comes inside building [door] from playcourt | - makes no movement to come inside<br>- stops or delays in the process of coming inside<br>- does not come inside w/in 10 sec. of cue |
| - peers seated at table(s) readying lunch<br>- immediately upon washing hands<br>- positioned at coat rack | "Get Lunch Box" | picks up lunch box from coat rack w/in 5 sec. of cue | moves toward coat rack | picks up lunch box from coat rack | - makes no movement toward coat rack<br>- stops or delays in the process of picking up lunch box<br>- does not pick up lunch box w/in 5 sec. of cue |
| - Afternoon - prior to going home at the [illegible] of the day | "time to go to the Kitchen for today" | gets up, goes to door of classroom w/in 5 sec. of manager cue | gets up or initiates movement toward door of classroom | is at door of classroom or w/ manager "taking" to door of classroom | - makes no movement toward the door or mgr.<br>- stops or delays in the process of going to the door or mgr.<br>- does not go to door or mgr w/in 5 sec. of cue |
| - positioned in front of coat rack | "get coat" | takes coat off of "hanger" on coat rack w/in 5 sec. of verbal cue | puts hands on coat | coat is off "hanger" (hook) Evelyn is holding | - makes no movement toward taking coat off hook<br>- stops or delays in the process of taking coat off hook<br>- does not take coat off hook w/in 5 sec. of cue |
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Dave / Craig

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|---|---|---|---|---|---|
| Coat off | Same | Same | Same | Same | Same |
| - upon removal of coat<br>or<br>- coat on floor | "Hang Up Coat" | "E" hangs coat on hook on coat rack w/in 3 sec of natural or verbal/gestural cue | - initiates movement w/coat to hook on coat rack | - coat hanging on rack | - makes no movement to put coat on hook w/i 3<br>- coat does not remain on hook<br>- takes longer than 3 sec to initiate movement |
| Pants Down<br>- in Bathroom [pants on hips in natural position] | Same | Same<br>3 sec latency. | - verbal cue<br>- Mr. [illegible] place "E" hands on waist band | Same<br>except conditional when [illegible] | Same |
| "E": "Sir" | Same | 3 sec. | Same | Same | Same<br>w/i 3 sec. |
| - Same Except: positioned anywhere in room<br>Get Lunch Box | Same | 3 sec latency | Same | Same | Same<br>w/i 3 sec |
| "Get Coat"<br>Same | Same | Same | Same | Same | Same |
| "Pants Up" →<br>Reverse of Pants Down | | pulls up pants to buttock w/i 3 sec of verbal gestural cue | places hands on waistband of pants | - pants are at a point just at buttock | - makes no movement to raise pants w/i 3 sec of verbal/gestural cue<br>- exceeds latency<br>- pulls pants part of the way |

Sub[illegible] Number ____________ Teacher DAVE

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| helmet placed in front of Gary | "Pick up helmet" | picks up helmet w/one or both hands w/in 3 sec. of verbal/visual cue | moves hand(s) toward helmet | grasps helmet, lifts off surface | - makes no movement toward grasping helmet<br>- grasps helmet, does not pick up<br>- does not pick up helmet w/in 3 sec of cue |
| - Kneeling on right knee<br>- hands on counter, table top, walker<br>- physical cue at buttock | "stand" | pushes to stand [both feet flat on ground] w/in 3 sec. of cue | pushes arms; straightens left leg | stands upright w/ both feet flat on ground | - makes no movement to stand<br>- stops or delays in the process of standing<br>- does not push to stand w/in 3 sec of cue |
| - seated at table during lunch or snack-time<br>- spoon on table or near plate | "Pick up spoon" | picks up spoon w/in 3 sec. of verbal/visual cue | moves right hand toward spoon | grasps spoon and lifts off surface | - makes no movement toward spoon<br>- stops or delays in the process of picking up spoon<br>- does not pick up spoon w/in 3 sec. of cue. |
| - in Quadrapedal position in front of counter, table or walker<br>- gestural cue provided by tapping surface | "hands on table"<br>" " walker<br>" " counter | puts both hands on surface w/in 3 sec. of gestural/verbal cue | moves hand(s) up toward surface | both hands on surface in kneeling position | - makes no movement to put hands on surface<br>- does not put hands on surface w/in 3 sec. of verbal cue |
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Subj[illegible] G [illegible]ter: Dave

| Stimulus Condition | Verbal command or signal | Excellent Response | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| Same | Walker<br>Same | Same | Same | Same | Same |
| Same | Stand<br>Same | Same | Same | Same | Same |
| Same | Spoon<br>Same | Same | Same | Same | Same |
| Same | Hands on Table<br>Same | Same | Same | Same | Same |
| - Using walker "stuck" for 20 sec or greater against obstacle<br>- gestural cue can be provided by tapping surface | G your stuck<br>You need to move your walker | - G moves walker w/ arms in apparent attempt to remove self from obstruction w/in 3 sec. of cue | Moves walker | - unsticks self and proceeds walking<br>- stops movement but does not extricate self from obstruction | - makes no movement w/walker w/in 3 sec of cue<br>- |
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Subject Number ____________ Teacher ____________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| Enters P.E. room | "find your place on the mat" | sits on assigned spot | moves toward mat | sitting on assigned spot | sits on non assigned spot |
| any time when seated | "stand up" | stands up within 8 sec. | positions legs to stand | standing | does not stand within 8 sec. |
| after standing from mat | "find your spot" | walks to assigned "X" on P.E. floor | moves toward "X" | standing on assigned "X" | moves in direction other than toward X |
| anytime | "come here" (designates where by pointing) | moves to designated spot | begins moving towards spot | reaches designated spot | does not move toward designated spot w/i 5 sec. |
| close of P.E. period | "go to class" | moves form P.E. room to next class within 3 min. | goes out door | when enters next period classroom w/i 3 min. | does not go to correct classroom w/i 3 min. |
| sitting, w/ feet on chair | "put your feet down" | puts feet on floor | straightens legs | feet on floor | feet remain on chair longer than 5 sec. |
| morning | "good morning, Eva" or hi Eva" | "good morning" or "hi" | begins speaking | end of phrase | no response w/i 5 sec. |
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Subject [illegible] 5+01 Teacher

| Stimulus Condition | [illegible] signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| enters room | no command | sits at table | moves toward table | is sitting in chair at table | goes to back of room, does sit at table |
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Subject [illegible]

| Stimulus Condition | Command [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| Comes into Pl[illegible] room | "Sit on the [illegible]" | [illegible] | moves toward seat | Sits in her assigned spot | wanders about room does not [illegible] |
| anytime | "Stand up" | | | | [illegible] down [illegible] |
| anytime | "[illegible]" | | | | moves away from T |
| [illegible] program [illegible] g) | [illegible] | [illegible] | | | does not [illegible] |
| | [illegible] | | | [illegible] | [illegible] |

Subject Number [illegible]

| Stimulus Condition | Command [illegible] | Compliant Response | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| anytime | Stand up | Stands up | [illegible] | Standing | does not move |
| enters PE room | "Sit on the [illegible]" | sits on mat | [illegible] mat | [illegible] | does not move, ~~does~~ not sit |
| After [illegible] from mat in PE room | Find your spot | walk to [illegible] X [illegible] | [illegible] | | [illegible] move |
| [illegible] wet pants [illegible] | "Take off your pants" | [illegible] | [illegible] | [illegible] | [illegible] |
| After [illegible] wet/soiled pants | [illegible] pants | [illegible] | [illegible] | | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| See Mayleen | [illegible] | | | | |
| [illegible] mouth | [illegible] | [illegible] | [illegible] | | [illegible] |
| [illegible] drawing programs | Do your zipper [illegible] | [illegible] | [illegible] | zipper [illegible] | [illegible] |

Subject Number ______ Teacher ______

| Stimulus Condition | Command (verbal or signed) | Compliance Response | Starts | Stops | Example |
|---|---|---|---|---|---|
| Enters 40 building | No command | puts coat in locker | walks toward locker | closed locker door | goes to wrong locker |
| locker door closed | no command | goes to room 45 | moves toward room 45 | arrives at doorway | goes to other room. |
| Standing in doorway of room 45 | "Go to language" | Turns around and walks to room 43 | turns toward hall | through doorway of room 43 | Goes into room 45. |
| Anytime sitting | "Stand UP" | Stands up | Leans forward | Standing | remains sitting longer than 5 sec. |
| Anytime standing | "Eva, Come, go____, etc. | Goes to designated area | Walks toward area | At designated area | Goes to anothe area. |
| Morning | "Good morning, Eva" or"Hi Eva." | "Good Morning" or "Hi" | Begins Speaking | End of phrase | no response w/i 5 sec. |
| Enters Judy's room after language | "Go get the lunch count" | Walks to room 48, picks up card with lunch count. | walks toward room 48 | lunch count in hand | Goes insid room 48, or goes to wrong room |
| Shown a picture in language | Where is___________?<br>What is_______doing?<br>Who is with _______? | Answers with at least 3-word phrase | Begins to speak | End of phrase | Less than 3 wor |
| Enters room 17 | Same as Dennis | Same as Dennis | SAme as Dennis | Same as Dennis | Same as Dennis |

Subject Number, Teacher

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | [illegible] |
|---|---|---|---|---|---|
| Sitting, w/feet on chair | "Put your feet down" | Puts feet on floor | Straightens legs | Feet on floor | Feet remain on chair longer than 5 sec. |
| End of period in Judy's room | "Go to Arlen" | Same as Dennis | Same as Dennis | | Same as Dennis |
| Enters P.E. Room | "Find your place on the mat." | Sits on assigned spot | moves toward mat | sitting on assigned spot | sits on non-assigned spot |
| any time when seated | "stand up" | stands up within 8 sec. | positions legs to stand | standing | does not stand within 8 sec. |
| After standing from mat | "find your spot" | walk to assigned "X" on P.E. floor | moves toward "X" | standing on assigned "X" | moves in direction other than towards "X" |
| anytime | "come here" (designates where by pointing) | moves to designated spot | begins moving toward spot | reaches designated spot | does not move toward designated spot |
| close of P.E. period | "go to class" | | | | |
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P.E /1

**Subject Number** ____ **Teacher** ____

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| anytime | "Stand up" | stands up | positions legs to stand | standing | does not move |
| after standing from mat in PE room | "Find your spot" | walk to assigned "X" on PE floor | moves toward "X" | stands on "X" | does not move |
| anytime | "Come" | move closer | begins movement toward T | in progress toward T | does not move; goes in incorrect direction |
| comes into PE room | "Sit on mat" | sits on mat | walks toward mat | sits on mat | does not sit on mat; doesn't move |
| ↑<br>getting ready [illegible] | "Arms up" | puts arms out [illegible] | [illegible] | [illegible] | [illegible] |
|  | "Hands on hips" | [illegible] | begins to raise [illegible] | [illegible] |  |
| ↓ | Touch your toes | [illegible] | [illegible] | [illegible] | ↓ |
| anytime | "Find your seat" | sits in chair |  |  | does not [illegible] |

**Subject Number** ________ **Teacher** ________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| comes into P.E room | "Find your spot on the mat" | sit on her spot on mat | moves toward mat | sits on her assigned spot | attempts to sit in un-assigned spot |
| anytime sitting | "Stand up" (8 sec) | stands up | positions legs to stand | standing | does not move |
| after standing from mat | "Find your spot" | walk to assigned "X" on PE floor | begins to walk toward "X" | stands on "X" | does not move goes in incorrect direction |
| anytime | "Come" | move closer to speaker (T) | begins moving [illegible] | in progress toward T | does not move |
| PE period over | Go to class | moves out PE door to hall | goes out door | Continues walking toward 20 bldg | does not move/goes in another direction |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

PE / [illegible]

**Subject Number** ______ **Teacher** ______

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| [illegible] | Stand [illegible] | [illegible] up | [illegible] | [illegible] | does not [illegible], turns away |
| [illegible] | 'Come' | [illegible] | [illegible] | [illegible] | [illegible] away from T |
| Comes into [illegible] | 'Sit on the mat' | [illegible] | | [illegible] | does not [illegible] |
| [illegible] | Put ball in [illegible] | [illegible] | [illegible] | [illegible] | [illegible] no [illegible] |
| [illegible] | 'Sit [illegible] | [illegible] | | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | Go [illegible] Kristi's | [illegible] | [illegible] | [illegible] | [illegible] wanders away |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

PE **Subject Number**

**Teacher** ____________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| Come into PE Room | no command | [illegible] | [illegible] mat | sits on mat | [illegible] about room |
| anytime | "Stand up" | [illegible] | [illegible] | Standing | does not move. |
| anytime | Come | [illegible] | [illegible] | [illegible] | does not [illegible] |
| after standing [illegible] mat in PE room | [illegible] spot | [illegible] | [illegible] | [illegible] | does not [illegible] |
| | | | | | |
| Lee May | | | | | |
| | | | | | |
| [illegible] | | [illegible] | [illegible] | | [illegible] |
| | | | | | |

PE
Homeliving
Dressing

Subject Number ____ Teacher ____

| Stimulus Condition | Command (verbal or signed) | Compliant Response | [illegible] | [illegible] | [illegible] Example |
|---|---|---|---|---|---|
| anytime | "Stand up" | Stands up | positions up to stand | Standing | does not move |
| enters PE room | "Sit on the mat" | Sits on mat | walks toward mat | Seated on mat | lies down on mat |
| after standing from mat in PE room | "Find your spot" | [illegible] to assigned [illegible] floor | starts to [illegible] | standing on [illegible] | does not move |
| [illegible] | [illegible] | [illegible] | | | |
| anytime | "Sit [illegible]" | sits on a chair | starts toward chair | seated in chair | [illegible] move |
| | | | | | |
| | | | | | |
| | | | | | |

3402

| Stimulus condition | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| [illegible] | [illegible] "Come" | [illegible] | [illegible] | arrives at destination | won't move |
| music class | Signed [illegible] "work" | [illegible] ([illegible]) | Leaving task | finishes task | throws watch on floor |
| anytime | [illegible] "Stand up" | Gets up | [illegible] | is standing | doesn't move |
| anytime | [illegible] sit | Sits | starts to sit down | remains seated | won't sit down |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Subject No. 2

| Stimulus Condition | Command (verbal or signed) | [illegible] | Starts | [illegible] | [illegible] |
|---|---|---|---|---|---|
| anytime | Signed + verbalized sit | sits down | begins to sit | Stands | won't sit |
| anytime | Signed + verbalized stand | Stands up | begins to stand | Sits | won't stand |
| anytime | Signed + verbalized play (signed by stopping playing action) | starts playing instrument | begins to [illegible] instrument | stops playing | won't play |
| anytime | [illegible] "NO" (take object out of mouth) | [illegible] object from mouth | begins to remove item from mouth | puts object back in mouth | keeps object in mouth |
| anytime | Signed + verbalized "COME" | [illegible] | begins [illegible] | stops walking | stops going in proper direct– |
| | | | | | |
| | | | | | |
| | | | | | |

Subject Name: Teacher:

| Stimulus Condition | Command [illegible] | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| enters room | Aaron sit at the table in the back | Aaron goes to back table and sits | moves towards table | sits in chair at back table | goes to wrong table<br>doesn't move |
| anytime sitting | "Aaron, stand up" | Aaron stands | begins standing | is standing | doesn't move |
| anytime standing | "Aaron, come" | Aaron comes to adult | begins moving | arrives near adult | doesn't move |
| after dropping objects on floor | Aaron, pick (it) up | Aaron picks up object | moves down | stands with object in hand | moves away from object |
| anytime | "go to . . ." | Aaron moves to said area | begins walking towards area | arrives at area | doesn't move |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Subject Name: 3764 Teacher

| Stimulus Condition | [illegible] or signed) | Compliant Response | Starts | Stops | Error Example |
|---|---|---|---|---|---|
| enters Room | ~~no command~~<br>sit at table (with sign) | may goes to table + sits | moves toward table | is sitting at table | doesn't move |
| anytime standing | "may, Come"<br>(with sign) | May moves near person speaking | moves toward person | Arrives near person | doesn't move |
| anytime sitting | May stand up<br>(with sign) | May stands | begins standing | is standing | doesn't move |
| anytime | "May, point to ..." | May points to requested object or person | lifts hand | points to ask object or person | doesn't move |
| | | | | | |
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Subject Name

| | | | | | |
|---|---|---|---|---|---|
| enters room | | | | | |
| objects in mouth | "not in mouth, Glenn" | takes object from mouth | begins removing from mouth | object out of mouth | leaves object in mouth |
| objects on floor | | | | | |
| anytime standing | | | | | |
| anytime sitting | | | | | |
| | | | | | |
| | | | | | |

Cathy F

Hill

| | | | | | |
|---|---|---|---|---|---|
| enters room | "Cathy, sit at that table" | Cathy sits at designated table | moves toward table | sits at table | doesn't move |
| anytime | "Cathy stop (rocking)" | Cathy sits still | → | | keeps rocking |
| anytime sitting | "Cathy, ~~sit down~~ stand up" | Cathy stands | begins getting up | stands | doesn't move |
| anytime standing | "Cathy, sit down" | Cathy sits | begins sitting | sits | doesn't move |

3702

Subject name: Aaron Dinoson [illegible]

| [illegible] Condition | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|---|---|
| comes in to school | hang up your coat | hangs up coat | [illegible] to [illegible] out | [illegible] | [illegible] |
|  | open your locker | opens locker | starts to [illegible] | [illegible] | without open locker |
|  | put in your lunch box | puts in [illegible] box | [illegible] put box [illegible] lock | [illegible] | [illegible] |
|  | [illegible] your locker | [illegible] locker | starts to [illegible] |  | [illegible] |
| time [illegible] | do your work | does task | starts to work | [illegible] | [illegible] |
|  | go to your [illegible] | sits down in chair | starts toward [illegible] | [illegible] | [illegible] |

Subject Number ____________ Teacher ____________________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | [illegible] |
|---|---|---|---|---|---|
| Coming into school | "Hang up your coat" | Hangs up coat | Starts to hang coat | Coat is hung up | Drops coat on locker floor |
| " " | Open your locker | Opens locker | Starts to open locker | Locker is open | Won't open locker |
| " " | Put in your lunch box | Puts in lunch box | Starts to put box in locker | Lunch Box is in locker | Drops lunch box on floor |
| " " | Close your locker | closes locker | Starts to close locker | Locker is closed | Won't close locker |
| Anytime in classroom | "Go to your chair" | Sits down in chair | Starts toward chair | Is seated | Refuses to go to chair. |
| " " | Do your work | Does work | Statrs to work | Work is finished | Throws work on floor. |
| | | | | | |
| | | | | | |
| | | | | | |

SUBJ NUMBER ___ TEACHER ___

| STIMULUS CONDITION | COMMAND (VERBAL OR SIGNED) | COMPLIANT RESPONSE | STARTS | STOPS | ERROR EXAMPLE |
|---|---|---|---|---|---|
| anytime | "stand up" | stands up | positions legs to stand | standing | does not stand |
| anytime | "come here" (points to designated spot) | moves to designated spot | begins moving towards spot | reaches designated spot | does not move toward designated spot |
| enters P.E. room | "sit on the mat" | sits on mat | walks toward mat | sitting on mat | moves in another direction |
| 1:1 dressing | "put belt in" | inserts belt into buckle | takes hold of belt ends | belt thru buckle | does not put belt thru buckle w/i 8 sec. |
| any time | "sit down" | sits down in a chair | moves toward chai | seated in chai | does not move w/i 5 sec. |
| getting ready to load bus | "put your coat on" | puts coat on | goes towards locker to get coat | coat is on | does not move w/i 5 sec. |
| close of P.E. period | "go to Kristi's room" | goes from P.E. to Kristi's w/i 3 min. | goes out door | enters Kristi's room | does not go to correct classroom w/i 5 min. |
| after signing needs to toilet | "go to the bathroom" | goes from room to bathroom | leaves room | arrives at bathroom | does not go from room to bathroom w/i 3 min |
| Enters room | Aaron, sit at the table in the back | Goes to back table and sits. | Moves toward table | Sits in chair at back table | Goes to wrong table- doesn't move |
| Anytime sitting | "Aaron, stand-up" | He stands | Begins standing | Is standing | Doesn't move |

Subject Number Teacher ______________

| Stimulus Condition | Command (verbal or signed) | Compliant Response | Starts | Stops | [illegible] Example |
|---|---|---|---|---|---|
| Anytime standing | "Aaron, come here" gestures where | Aaron comes to adult | Begins moving | Arrives near adult | Doesn't move |
| After droping Object on floor. | "Pick it up " | Picks up object | Moves down | stands w/obj in hand | Moves away from onbject. |
| Anytime | "Go to" (said area) | Moves to designated area. | Begins walking towards area | Arrives at area | Does not move |
| | | | | | |
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# APPENDIX C

## Overview of Data-Based Performance Rules
## (Making Daily Classroom Decisions)

# MAKING DAILY CLASSROOM DECISIONS[1,2]

by

Owen R. White
University of Washington

In the beginning nature provided the only education available. If a pupil failed to prosper and progress under nature's tutelage, he or she simply ceased to exist. It was rather an all or nothing, inflexible system. It was such an effective system, however, that it changed surprisingly little until very recent times. True, as the human species became more "civilized" it developed more effective means for supporting the basic existence of its members, but from an educational standpoint, it remained quite inflexible. If a pupil failed to prosper and learn under a given educational system, the pupil was simply dismissed. Eventually, certain compassionate and open-minded people began to realize that children who failed to do well in a typical educational system might still meet with success if alternative approaches were explored. Schools for the deaf, the blind, the orthopedically handicapped and even the mentally retarded began to emerge. The "system" began to respond to the needs of the children, rather than demanding that the reverse be true.

Initial attempts to adapt educational approaches to meet the needs of the pupil were centered on the notion that children, while not all alike, could still be classified into relatively homogeneous subgroups. If a child was blind, he needed "mobility" training. If a child were deaf, certain adaptations were required in the communication curricula. If a child were crippled, various occupational therapy or physical therapy approaches would be advised. If a child were mentally retarded, the curriculum would be watered down, a ceiling on expected development would be imposed, and basic skills would be drilled in endless repetition. Each approach was, in retrospect, still likely to be somewhat inflexible, but at least it represented some attempt to meet the special needs of the pupil. It was a start.

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[1] This paper was originally prepared for presentation at the 1981 national conference of the American Educational Research Association in Los Angeles California. The presentation was part of a symposium entitled "Issues in the Assessment of Handicapped Infants and Preschool Children," chaired by Walter Hodges, 15 April 1981.

[2] The research leading to the development of the rules presented in this paper was supported, in part, by a grant entitled "An Investigation of Stages of Learning and Facilitating Instructional Events for the Severely/Profoundly Handicapped" (Norris G. Haring, Principal Investigator), funded by the U.S. Office of Special Education, Department of Education, Project No. 443CH6039A, Grant No. G007500593; and by a grant entitled, "The Impact of Evaluation in Special Education" (Owen R. White, Principal Investigator), funded by the U.S. Office of Special Education, Department of Education, Project No. 443CH00399, Grant No. G007605521 Those interested in copies of the final project report for those grants should contact the author at the Experimental Education Unit, Child Development and Mental Retardation Center, WJ-10, University of Washington, Seattle, WA 98195. Persons undertaking to conduct such projects under government sponsorship are encouraged to express freely their own professional judgment in the interpretation of results. Points of view or opinions expressed in this paper, therefore, do not necessarily represent the official position of the U.S. Office of Special Education.

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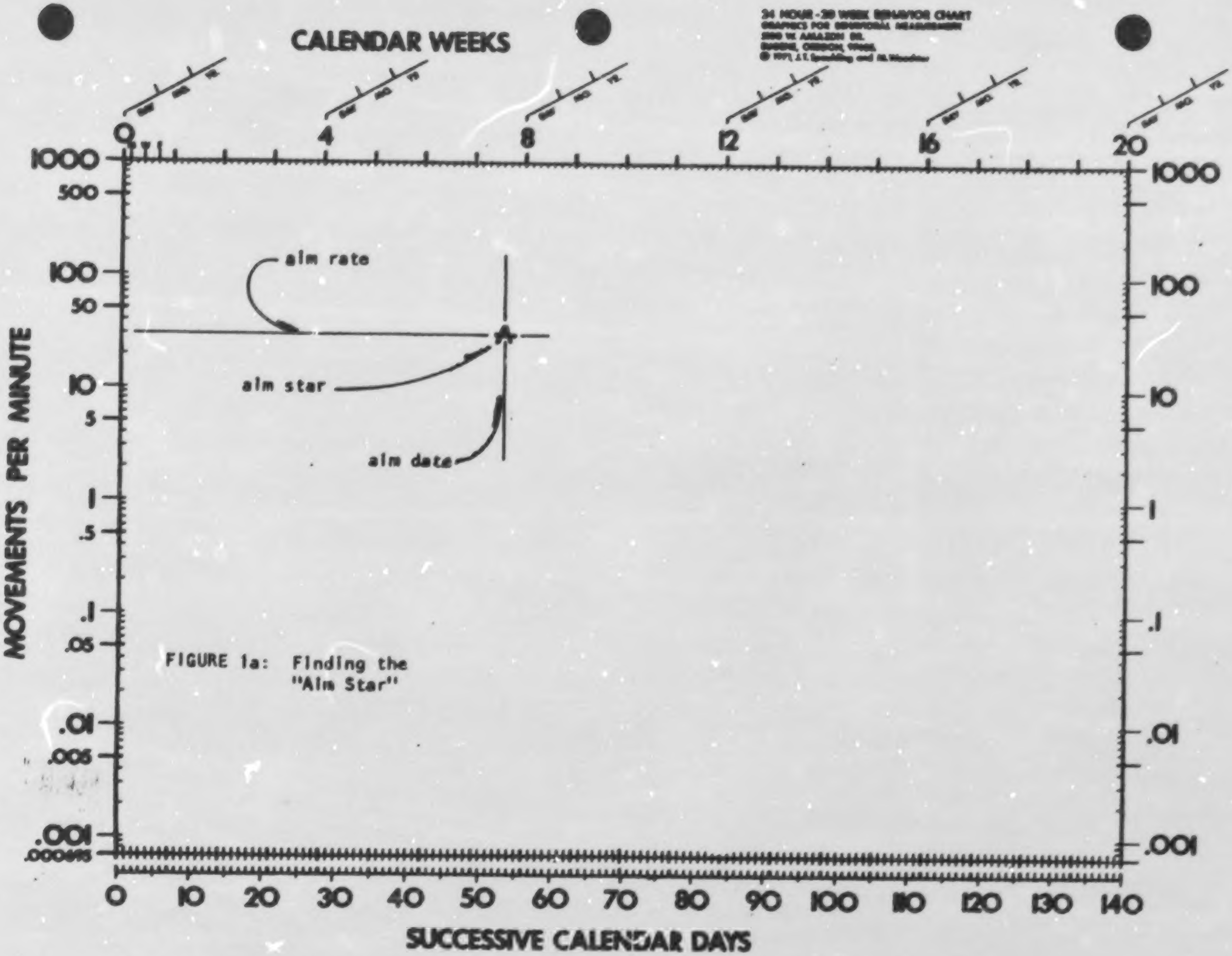

FIGURE 1a: Finding the "Aim Star"

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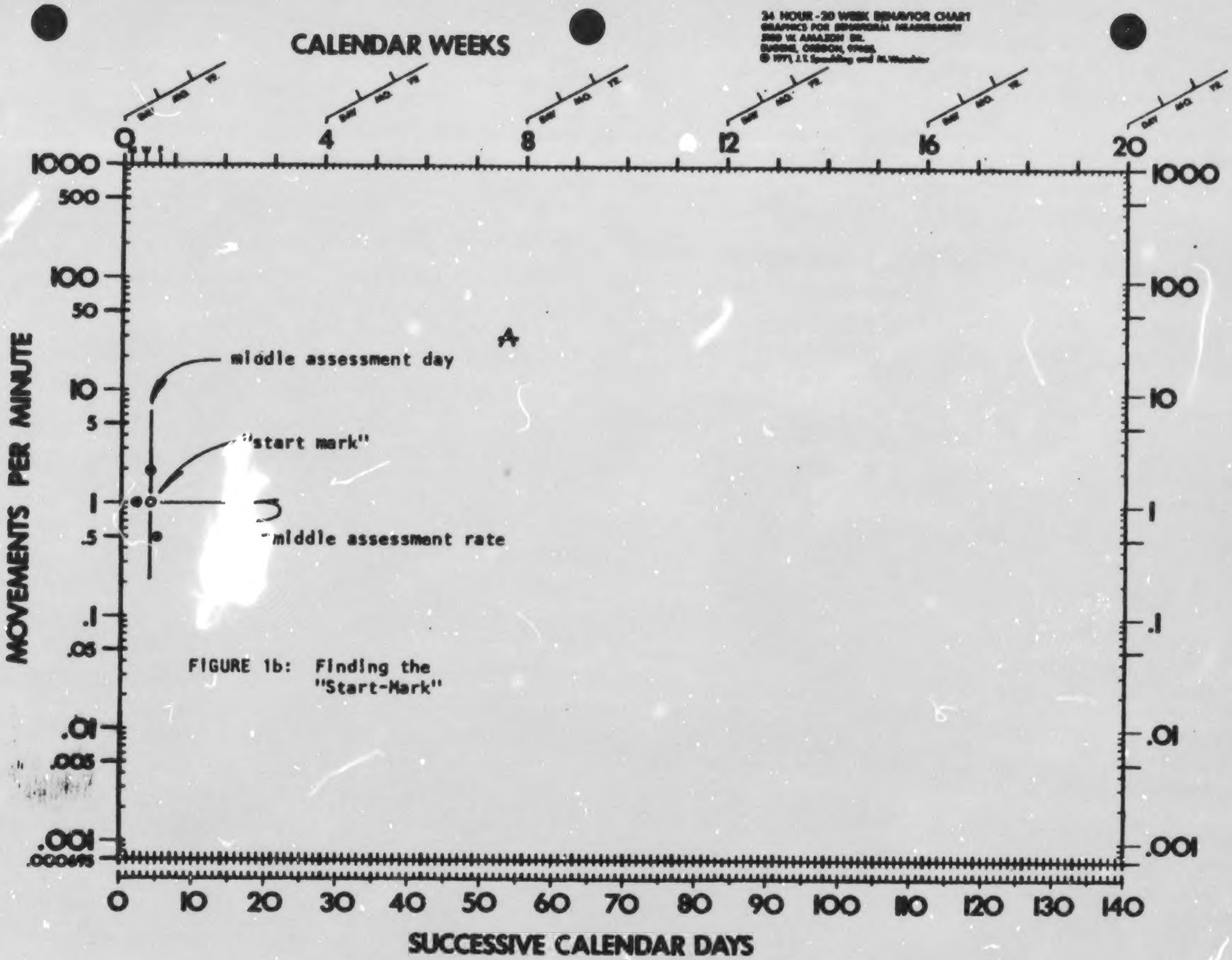

FIGURE 1b: Finding the "Start-Mark"

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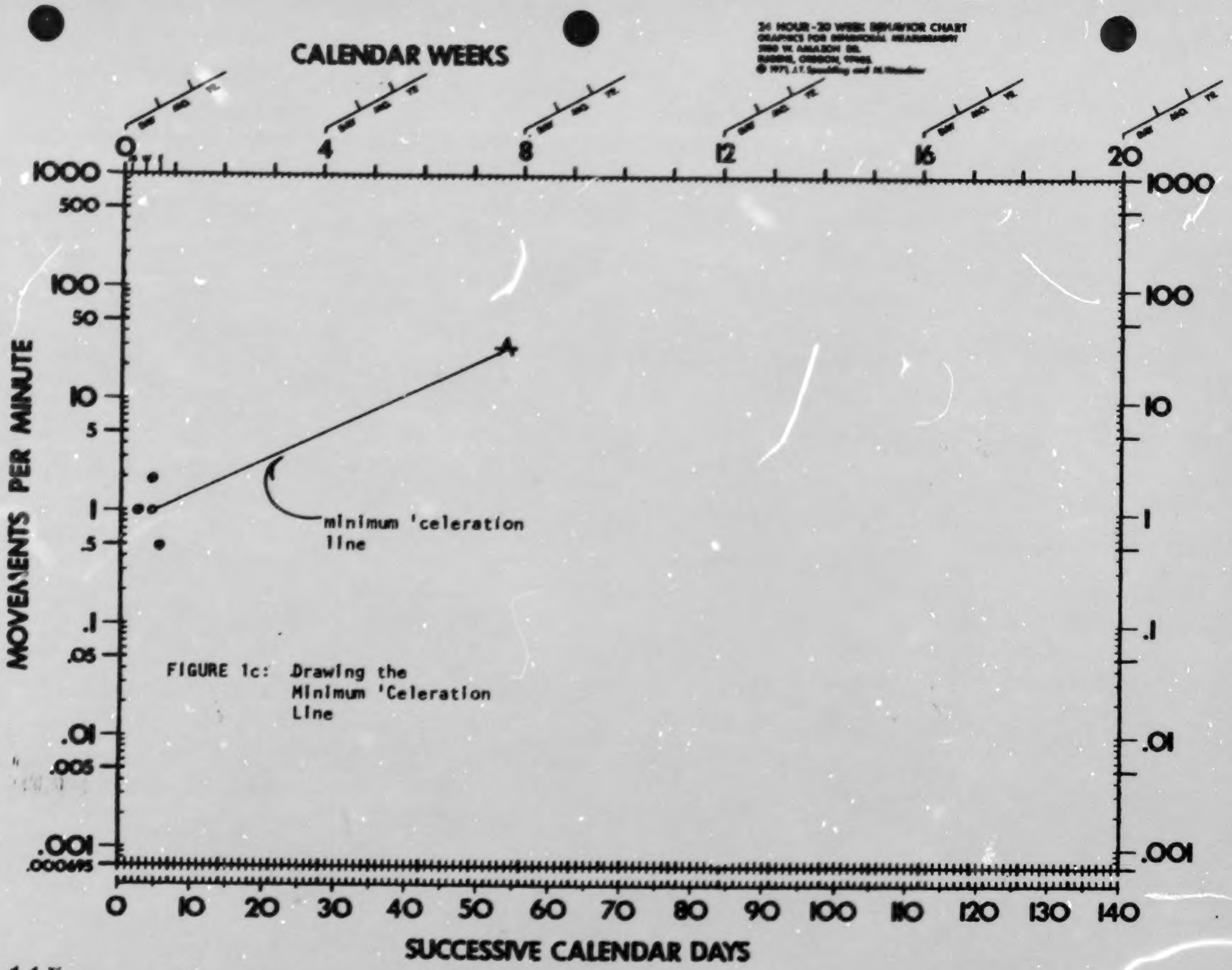

FIGURE 1c: Drawing the Minimum 'Celeration Line

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In the last fifteen or twenty years, attempts to identify appropriate educational strategies based on observable child characteristics have become quite refined and sophisticated. In what has become known as "diagnostic/prescriptive teaching," extensive and detailed assessments are conducted to evaluate the pupil's physical well being, current level of performance in a wide range of skill development areas and, perhaps, even the child's reaction to various instructional procedures and environmental conditions (c.f., White, in press). The precision with which potentially effective instructional programs could be identified improved dramatically. As traditionally practiced, however, even the diagnostic/prescriptive approach to program development was relatively inflexible after the initial program was devised and implemented. The pupil might be reassessed every few months or at the end of each year, but between those infrequent assessments, programs were generally conducted in a consistent and unchanging manner. It wasn't until the late nineteen sixty's when the notion of more frequent assessment and systematic program revision began to take hold.

In an article entitled the "Direct measurement and prosthesis of retarded children," Lindsley (1964) suggested that teachers might successfully apply basic behavioral methodology in their classrooms. That is, if teachers were to carefully document the conditions under which instruction takes place and monitor daily pupil progress, they would be able to identify program revision needs in a more timely manner and judge the effectiveness of each new program more precisely. For the most part, Lindley's suggestions worked, and today there are literally thousands of teachers, parents, children and other people using what has become known as "Precision Teaching." In essence, Precision Teaching is a set of guidelines for describing behavior, the instructional plan or conditions under which the behavior occurs, monitoring the frequency or rate with with the behavior occurs, charting the pupil's progress on a standard "behavior chart" and describing the changes which occur in the behavior or rate of progress with each new revision in the plan.

The feedback which Precision Teaching provides concerning the effectiveness of different instructional approaches can be very powerful in helping teachers to shape their own behaviors and become more responsive to the individual needs of each pupil. If the pupil's correct rates are "going up" and the errors are "going down", the program can be left alone. If the pupil is "flat" (not changing) or changing in the wrong direction, the program should be revised...and revised again...and again, until the pupil begins to make satisfactory progress in the right direction. That seems simple. But there are times when it doesn't prove simple enough.

One of the advantages to Precision Teaching is its highly standardized, uniform approach to monitoring and charting the course of a pupil's progress. Since the same type of chart is used to display all of the programs one might be running, it is possible to make quick and meaningful comparisons among programs and to develop a "feel" or "expectancy" concerning the way successful programs should look. That facilitates the formation of progress standards and, in turn, makes it easier for teachers to spot programs that need to be revised. It takes time to develop those expectancies and standards, however, and many teachers simply don't work with the system long enough to reach a point where it becomes truly useful. Even for teachers who have developed standards and expectancies, the charted record of a pupil's progress can sometimes be difficult to interpret. Children don't always just "march up the chart" in a nice, orderly fashion. They may progress for several days in a row and then "backslide." Some children's performances are so erratic that it's difficult to determine whether the program is working or not. Finally, even if it becomes obvious that a program is not working as it should, many teachers are at a loss as to what they might change. The net result of all those problems is that even when teachers faithfully monitor and chart the pupil's progress every day, a certain proportion of those programs may be ineffective and yet be continued ad nauseam.

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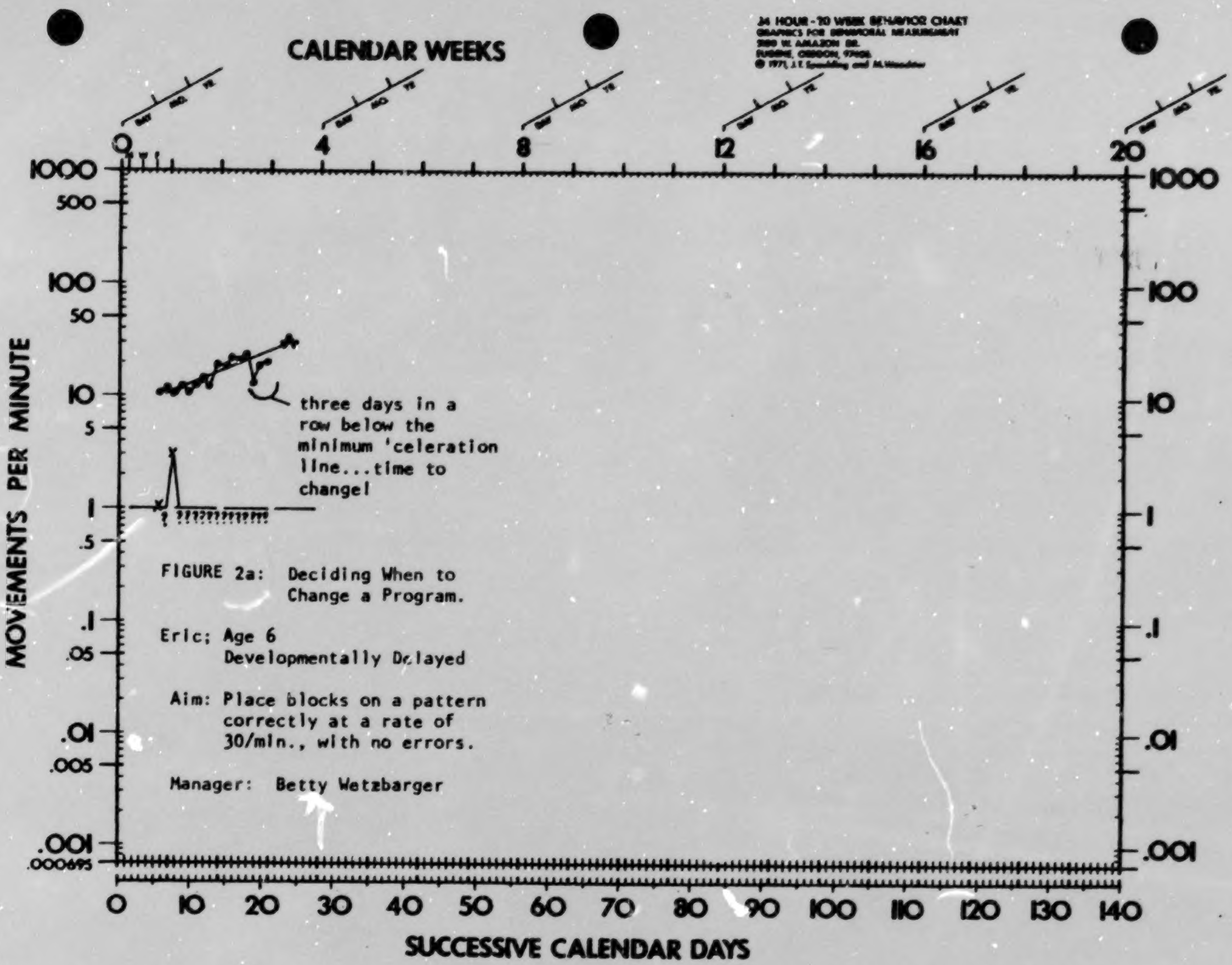

three days in a row below the minimum 'celeration line...time to change!

FIGURE 2a: Deciding When to Change a Program.

Eric; Age 6
Developmentally Delayed

Aim: Place blocks on a pattern correctly at a rate of 30/min., with no errors.

Manager: Betty Wetzbarger

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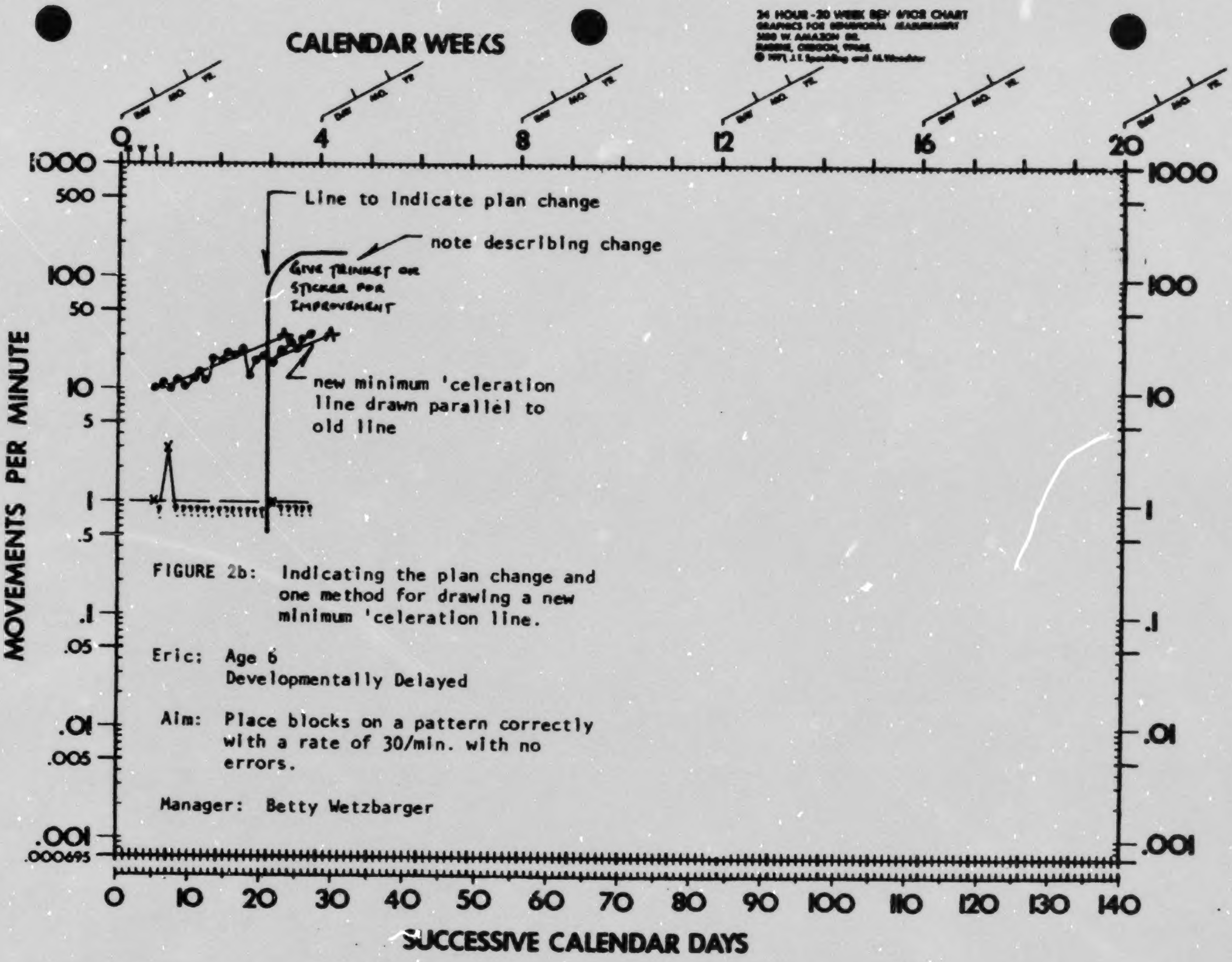

Line to indicate plan change

note describing change

GIVE TRINKET OR STICKER FOR IMPROVEMENT

new minimum 'celeration line drawn parallel to old line

FIGURE 2b: Indicating the plan change and one method for drawing a new minimum 'celeration line.

Eric: Age 6
Developmentally Delayed

Aim: Place blocks on a pattern correctly with a rate of 30/min. with no errors.

Manager: Betty Wetzbarger

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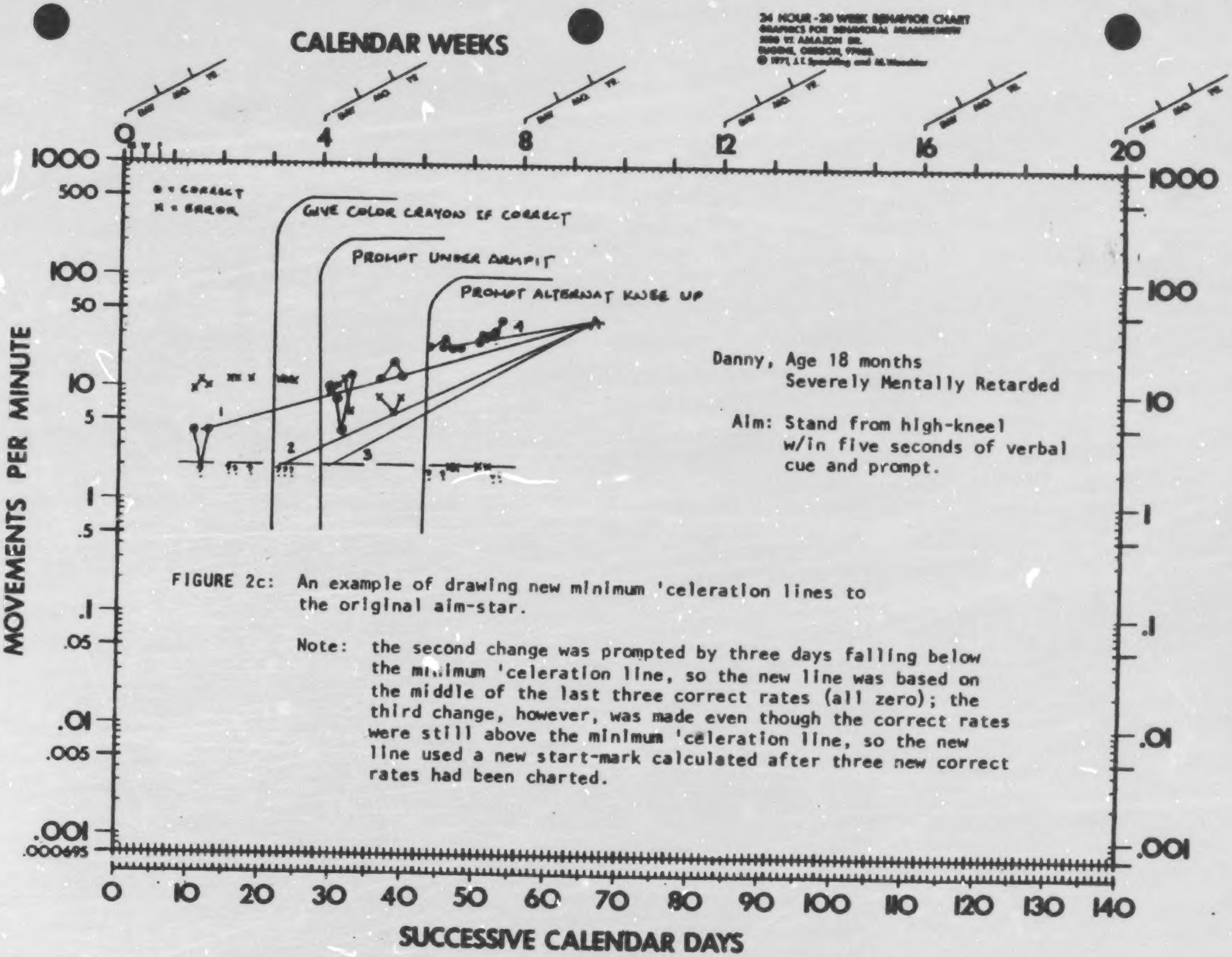

Danny, Age 18 months
Severely Mentally Retarded

Aim: Stand from high-kneel w/in five seconds of verbal cue and prompt.

FIGURE 2c: An example of drawing new minimum 'celeration lines to the original aim-star.

Note: the second change was prompted by three days falling below the minimum 'celeration line, so the new line was based on the middle of the last three correct rates (all zero); the third change, however, was made even though the correct rates were still above the minimum 'celeration line, so the new line used a new start-mark calculated after three new correct rates had been charted.

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The rules discussed in this paper were developed over a period of about ten years to address these problems. Specifically, they were developed to help teachers make more timely and effective decisions about: 1) when a program should be changed, and 2) how a program should be changed. Before discussing those rules, however, it is important to point out that they do not replace the basic procedures of Precision Teaching. Rather, the new rules discussed in this paper only expand that system to make it more immediately and consistently effective as a feedback mechanism for teachers. Indeed, although the rules discussed here might conceivably be adapted for use with other systems for monitoring and charting pupil progress, this author is convinced that they would be far more clumbsy to use. Indeed, the rules themselves would never have emerged if it were not for the fact that the Precision Teaching system allows such a diverse range of behavior to be placed in a common, easily interpreted perspective. It will help, therefore, to begin with a few of the basic Precision Teaching tenets.

## Some Basic "Givens"

In order to derive the greatest benefit from the rules which will be discussed in this paper, the following practices must be employed. For a more complete description and discussion of each practice, the reader should consult one of several available books on Precision Teaching (e.g., White & Haring, 1980; Kunzelmann, Cohen, Hulten, Martin & Mingo, 1970; Pennypacker, Koenig & Lindsley, 1972). A more complete list of desirable "givens" may also be found in Haring, Liberty & White (note 1).

### Build Behavior

The primary function of a teacher is to help each pupil build new skills or refine old skills (e.g., learning to tie shoes, identify numbers, or improve speech patterns). The rules which will be discussed in this paper were designed to help make the right decisions in just that type of situation. If the teacher also finds it necessary to "manage" certain behaviors (e.g., to decelerate "self-stim" or "agressive behavior"), the rules discussed below may still be of help in deciding whether a program is working, but they will not help in deciding what type of revision to try if the program is not working.

### Provide Opportunities for the Pupil to Demonstrate the Behavior

In order to accurately assess a pupil's progress in building or refining a skill, the pupil must first be given the opportunity to practice and demonstrate the skill. Ideally, situations will be set up which allow the pupil to demonstrate the skill at least ten times during any given assessment. If that is not possible, the rules which will be discussed in this paper can be adapted to help make decisions about "low frequency" behavior (c.f., Haring, Liberty & White, note 1), but those adaptations will be somewhat harder to use. Of course, concern for the number of opportunities provided for practice should extend beyond a single assessment. It is also important to provide for practice on as many days of the week as possible. The rules discussed in this paper will be most useful (and the pupil will make better progress) if practices and assessments are scheduled daily.

### Collect Information Concerning both Count and Time

Traditionally, teachers monitor only the number of correct and error behaviors a child emits during an assessment and then, perhaps, translate those counts into a "percentage correct" statement which describes the pupil's accuracy. For reasons which will become more apparent later in this paper, accuracy or percentage data alone will not be sufficient for choosing the most effective instructional procedures.

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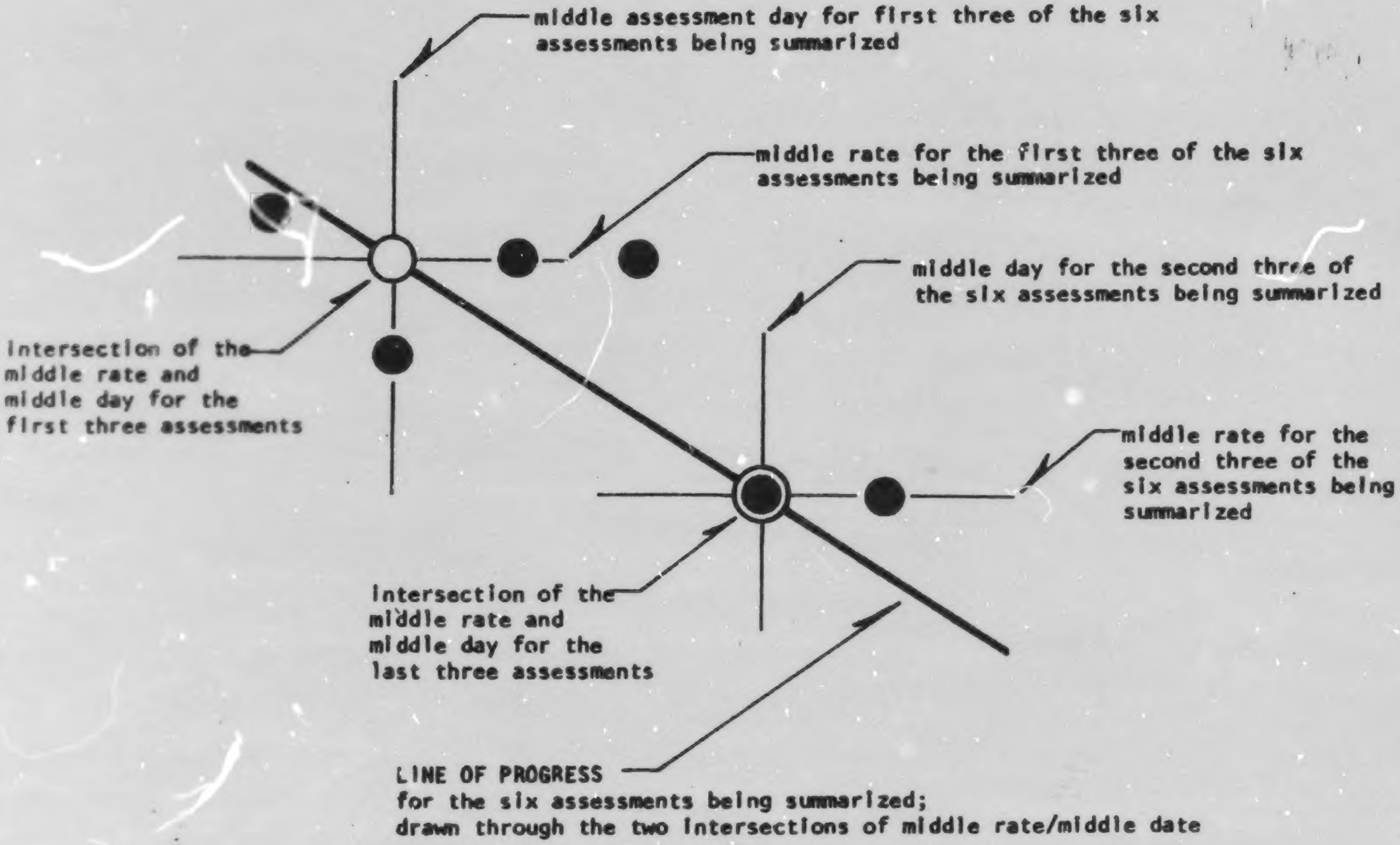
middle assessment day for first three of the six assessments being summarized
middle rate for the first three of the six assessments being summarized
middle day for the second three of the six assessments being summarized
intersection of the middle rate and middle day for the first three assessments
middle rate for the second three of the six assessments being summarized
intersection of the middle rate and middle day for the last three assessments
LINE OF PROGRESS
for the six assessments being summarized;
drawn through the two intersections of middle rate/middle date

FIGURE 3: Drawing a line-of-progress to describe the average change in correct rates over the last six assessment days. Correct rates are shown as solid dots; intersections of middle days and middle rates are shown as open circles.

Each assessment should also be conducted in a manner which allows the evaluation of the pupil's fluency, or the "ease" with which he or she is able to complete the task. The most common method is to count the correct and error behaviors, time the entire assessment session, and then divide the counts by the time to find the pupil's "correct rate per minute" and "error rate per minute." In some cases, however, latency (timing how long it takes a child to begin to respond) or duration (how long does each response take to complete, once it begins) will be more useful. The rules presented in this paper pertain only to rate data, but rules for other time-based types of data have also been developed (c.f., Haring, Liberty & White, note 1).

**Chart the Pupil's Progress**

Most of the rules for deciding when and how to change programs require that the teacher have a clear picture of the pupil's day-to-day progress over at least the last week (and frequently for periods extending much further back). The easiest way of forming that picture is to keep a simple chart of assessment results. The rules discussed here were originally developed using the standard behavior chart[3] and are expressed in terms which require that the same type of chart be used by the person who wishes to employ the rules. The rules might be adapted for use with other types of charts (or, indeed, no chart at all), but would probably be much more difficult and time-consuming for the teacher to employ.

**Set Aims**

The rules for deciding when and how to modify instructional programs to make them more effective will only work if the teacher has a clear set of aims or goals in mind. Specifically, it is important that separate performance aims be established for correct and error behaviors (e.g., sorting shapes correctly at a rate of 30 per minute with two or fewer errors) and that a specific date has been set for reaching those aims. If there are no performance aims, it will be impossible to tell when the pupil has adequately demonstrated the skill to be taught; and if there is no aim-date, then it will be impossible to tell if a pupil is progressing at an acceptable rate.

Assuming that each of the conditions outlined above has been met, it will be relatively simple to apply the decision rules as described in this paper. By necessity the review of the rules which follows must be brief — perhaps too brief to provide the reader with enough information to actually implement the rules successfully. If so, the reader is encouraged to consult White & Haring (1980) and Haring, Liberty & White (note 1) for more detailed information and examples.

## Deciding When to Change

If a pupil is making no progress at all, the need for a program change should be obvious. Difficulty arises, however, when trying to decide whether a pupil who is progressing is developing the skill rapidly enough to reach his or her performance aim within the time available. Some "standard" for acceptable progress needs to be established. The simplest and most useful way of establishing that standard is to find what Liberty (1972) calls the "minimum 'celeration line."[4]

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[3] O.R. Lindsley and C.H. Koenig, Standard behavior charts are available through Behavior Research Co., Box 3351, Kansas City, KS 66103.

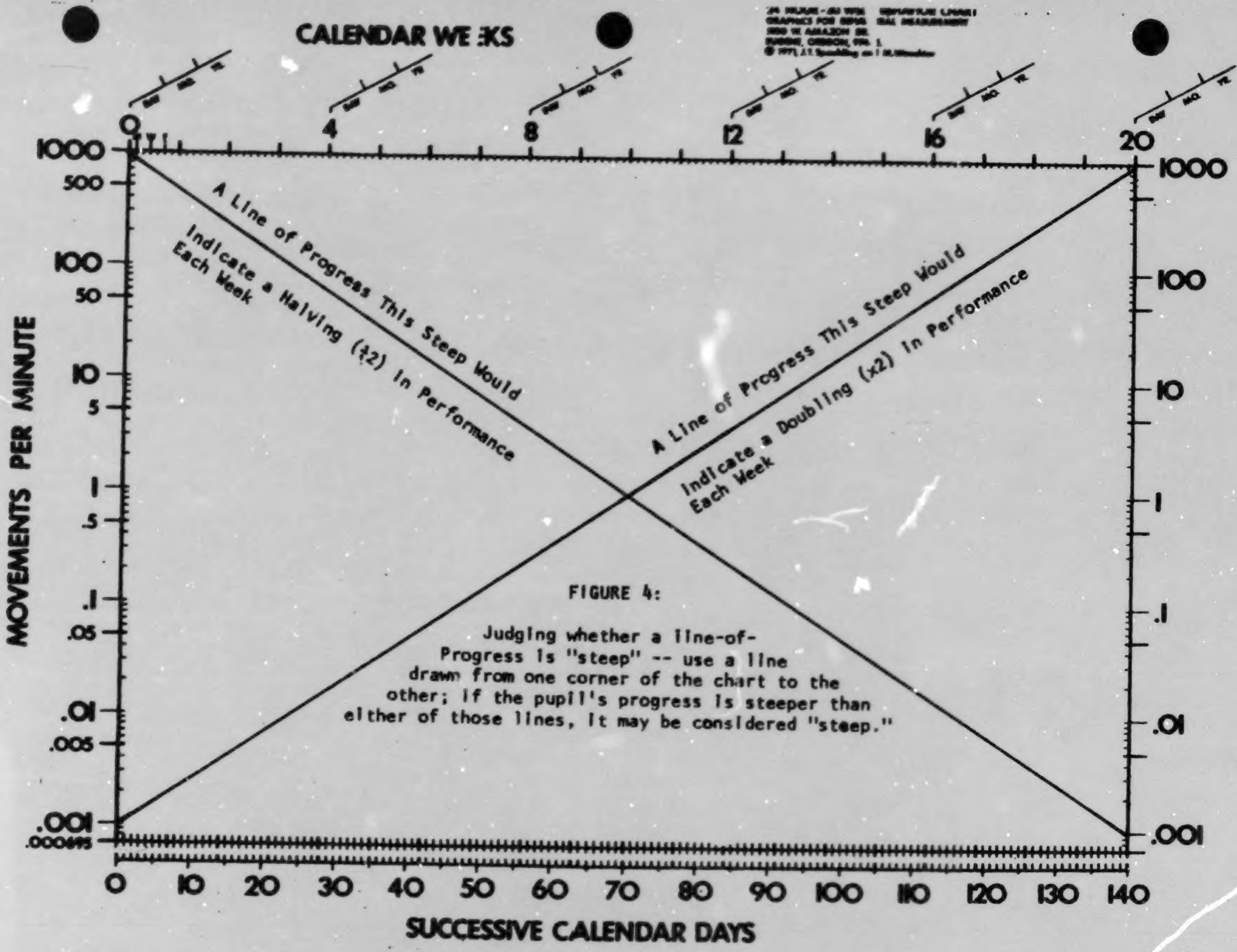

FIGURE 4:

Judging whether a line-of-Progress is "steep" -- use a line drawn from one corner of the chart to the other; if the pupil's progress is steeper than either of those lines, it may be considered "steep."

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### Finding the Minimum 'Celeration Line

1) Draw an Aim-Star on the Chart. The instructional aim is indicated on the chart by drawing a little star at the intersection of the performance aim and the aim-date. For example, if the instructional aim is to raise the pupil's correct rate to alevel of 30 correct behaviors per minute within three weeks, the star would be drawn on intersection of the line which represents 30 per minute on the chart and the line which represents a day three weeks in the future (see Figure 1a).

(2) Complete Three Daily Assessments of the Skill. Any single assessment of a child's skill may be misleading. The child may not feel well on any given day, or perhaps it will take a little time for the child to understand what the teacher wants him or her to do. In any event, in order to get a reasonably accurate picture of the pupil's actual skill at the beginning of the program, it is advisable to assess the pupil for at least three days.

(3) Draw a "Start-Mark" to Indicate the Pupil's Initial Skill. The results of the first three assessments are summarized by drawing a little circle, or "start-mark" at the intersection of the middle (second) day of the three assessments and the middle (second to lowest or highest) performance value (see Figure 1b).

(4) Draw the Minimum 'Celeration Line. Having decided where we want the pupil to end up (the aim star) and where the pupil is now (the start-mark), it is a simple matter to describe how rapidly the pupil will have to progress to get from one to the other. Just draw a line from the start-mark to the aim-star. That line does not necessarily describe how rapidly the pupil *will* progress, but it does establish a minimum standard for *acceptable* progress if the pupil is to reach his or her aim within the time available (see figure 1c).

### Using the Minimum 'Celeration Line to Decide If and When a Program Change Should Be Made

(1) Continue to monitor the pupil's progress. Assess the pupil as often as possible and chart the results.

(2) If the pupil falls below the minimum 'celeration line for three days in a row, change the program. The pupil may fall below the line for one day, or even two, and still have little or no difficulty in reaching his or her aim on time. Experience has shown, however, that if a pupil falls below the minimum 'celeration line for three days in a row, there is less than a 6% chance that he or she will still reach the aim by the date established -- unless a change in the program is made (Liberty, 1972; White & Liberty, 1976)(see figure 2a).

(3) Change the Program. Revise the instructional plan and implement the new program as quickly as possible (rules for deciding how to change the instructional plan will be discussed later). Note the change in program on the chart by drawing a heavy vertical line just before the day when the new program was put into effect.

(4) Draw a New Minimum 'Celeration Line. Since the pupil has already failed to meet the old minimum 'celeration line, it will be necessary to establish a new standard for progress. If the aim-date can be delayed somewhat, the new line might be drawn from the pupil's current level of performance, parrallel to the old minimum 'celeration line, until it crosses the previously established performance aim (see figure 2b). If the aimdate cannot be changed, then draw the new line from the current level of performance to the old aim-star (see figure 2c). Daily assessments are then continued, and the rules described above are employed with the new minimun 'celeration line to decide if any further changes are needed.

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[4] 'Celeration is the root of deceleration and acceleration -- the two directions that performance can change.

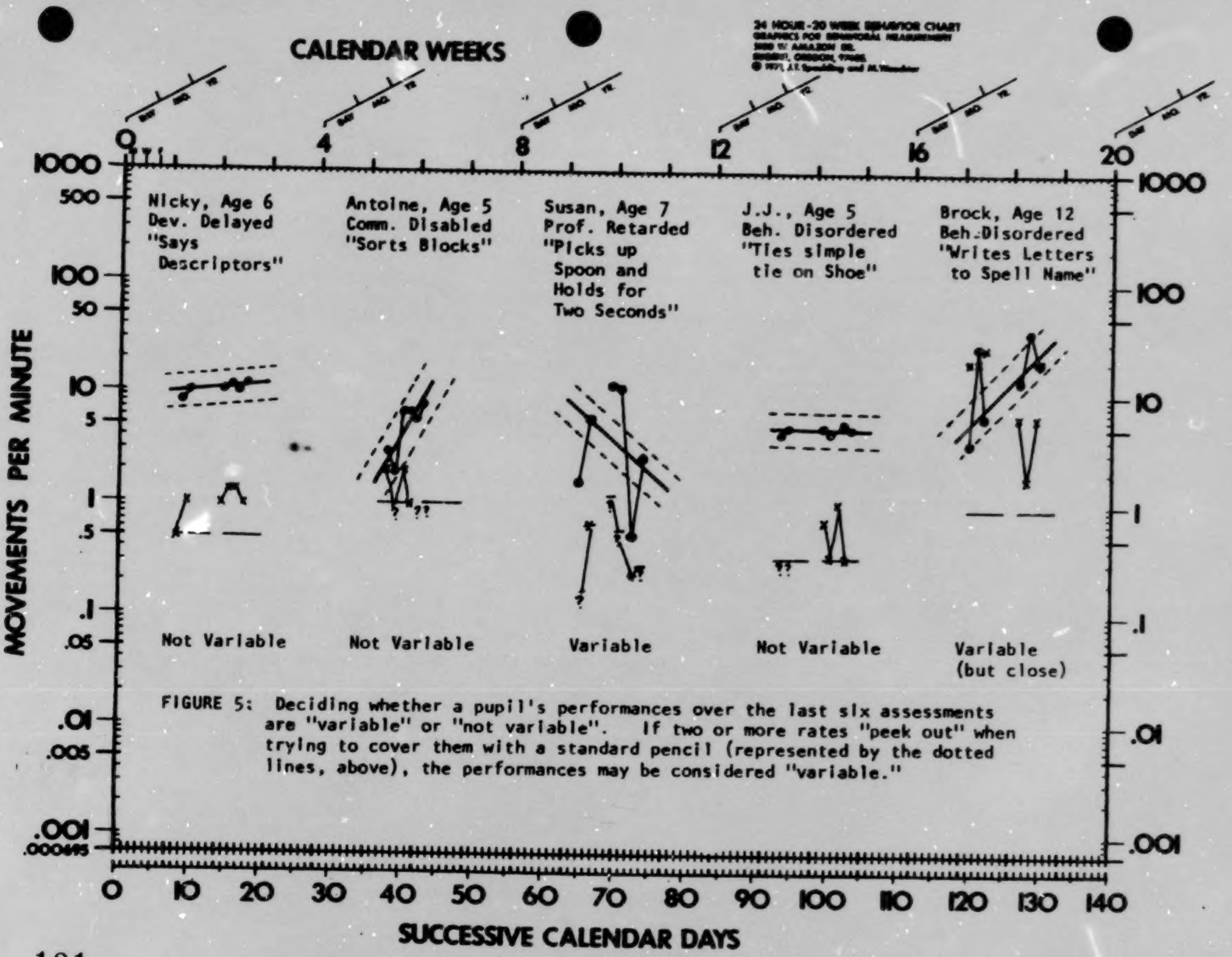

FIGURE 5: Deciding whether a pupil's performances over the last six assessments are "variable" or "not variable". If two or more rates "peek out" when trying to cover them with a standard pencil (represented by the dotted lines, above), the performances may be considered "variable."

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### Does the Minimum 'Celeration Line Really Help?

Yes, it would appear that the minimum 'celeration line can significantly improve the chances that timely decisions will be made about the need for program revision and, in turn, that those decisions will result in greatly improved pupil progress. In one study (Bohannon, note 2), teachers were more than five times more successful in remediating skill deficits when they employed the minimum 'celeration line than when they did not. In another study, pupils in classes using the minimum 'celeration line consistently achieved higher rates of progress than similar pupils in classes where those procedures were not used, even if the teachers in those other classes were still collecting and charting daily assessment information (Mirkin, Note 3).

## Deciding What to Change

If and when a program change becomes necessary, there are several different ways in which the program might be revised. The most common strategies include:

(1) Stepping back to a more basic, easier skill;

(2) Revising instructions, cues, prompts, materials or feedback strategies in an attempt to provide the pupil with more information about how the task should be completed and what is expected of him or her;

(3) Provide more powerful reinforcers or consequences in an attempt to increase or maintain the pupil's incentive to work as well as he or she is able; or

(4) Step ahead to a more advanced skill, and assume that the pupil has really mastered the skill in question and only needs "greater challenges."

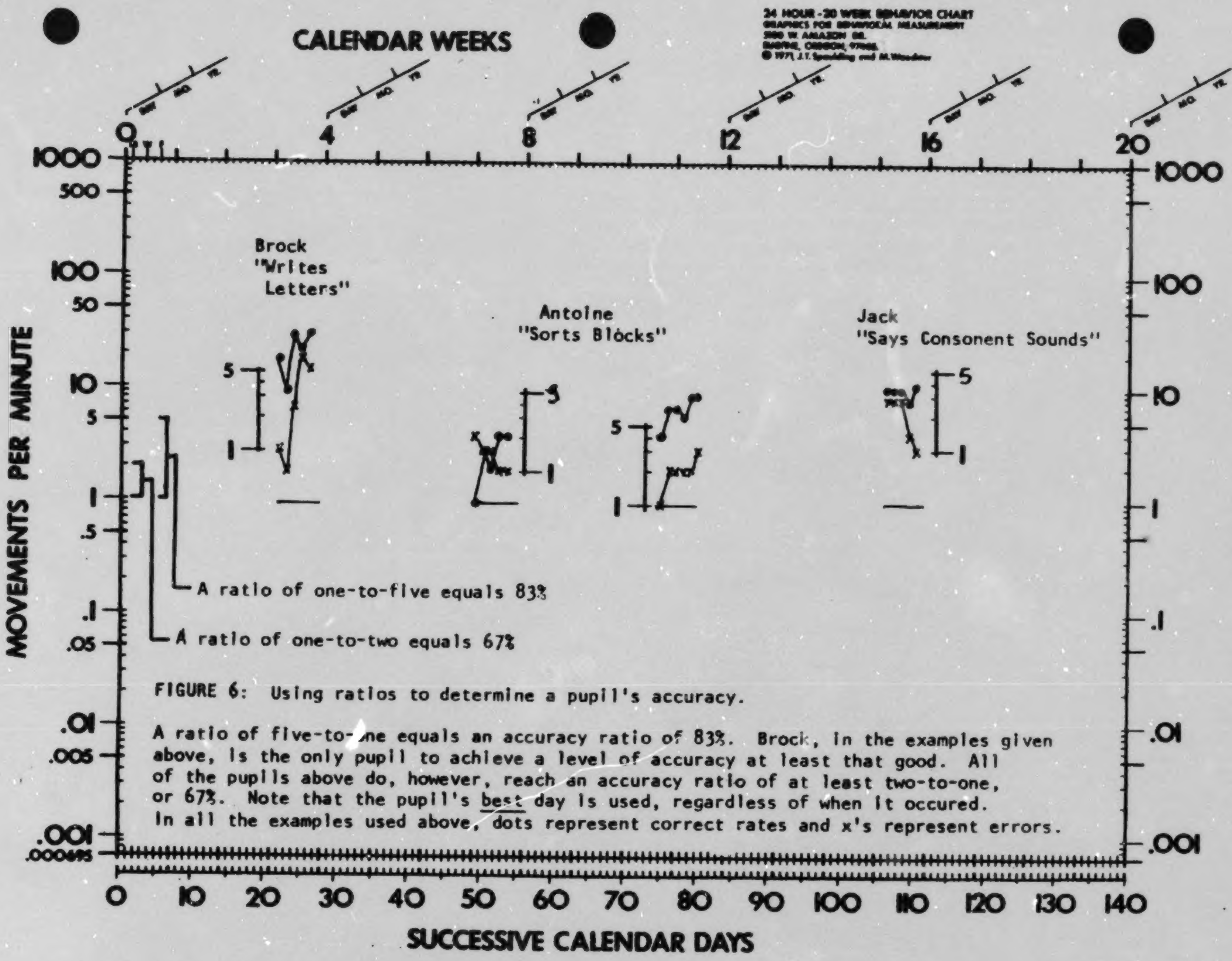
Teachers are likely to prefer only one of the strategies listed above, only trying something else if their preferred strategy meets with consistent failure. The most commonly preferred strategy is stepping back (Haring, Liberty & White, note 4), possibly because it is more comforting to assume that the pupil needs something easier, rather than question the effectiveness of the basic instructional plan. In fact, however, no single strategy is likely to be consistently successful, and even if a plan meets with initial success in promoting pupil progress, it may lose its effectiveness as the pupil's needs change. The decision rules discussed below have been designed to assist the teacher to identify the actual instructional needs of the pupil at any given point in time; and select the type of program revision which is most likely to meet the pupil's changing needs.

### Phases of Learning & Changing Instructional Needs

In order to truly master any given skill, a pupil will pass through several different phases of learning: acquisition, fluency-building, application and adaptation. Each new phase will impose somewhat different demands upon the learner and, in turn, may require adjustments in instructional strategies if continued progress toward mastery is to be realized. The research discussed in this paper addressed only the first two levels of learning (acquisition and fluency building), so the remainder of this paper will discuss only them.

Acquisition. At first, a pupil must acquire a basic competence in performing the skill correctly -- he or she must learn how to perform the task. If the pupil runs into difficulty during this phase of learning, revisions in the instructional plan designed to provide the pupil with more information (e.g., cues, prompts, corrective feedback) are most likely to be successful. That is not to say that "motivation" may not be a problem, but arranging only for more powerful reinforcers when the pupil simply does not know what to do is very unlikely to be sufficient.

Fluency-Building. It is not sufficient for a pupil to simply acquire, or know how to perform a skill. Practice with the skill must continue until until the pupil can perform the task well. The level of fluency required with a skill is usually based on some form of competition, but not necessarily in the traditional sense of the word.



A ratio of one-to-five equals 83%

A ratio of one-to-two equals 67%

FIGURE 6: Using ratios to determine a pupil's accuracy.

A ratio of five-to-one equals an accuracy ratio of 83%. Brock, in the examples given above, is the only pupil to achieve a level of accuracy at least that good. All of the pupils above do, however, reach an accuracy ratio of at least two-to-one, or 67%. Note that the pupil's best day is used, regardless of when it occured. In all the examples used above, dots represent correct rates and x's represent errors.

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Competition with peers may play a role with some skills (e.g., atheletic or academic games), but more often than not, the fluency standards for most of a preschooler's skills will be determined by adults or other behaviors in the pupil's own repertoire. For example, if a child's parents have only about 15 minutes to see that their child is dressed so they can complete their morning routines and get to their jobs on time, then the child must meet that fluency standard or the parents will simply not allow the child to dress himself. Similarly, if it is easier for the child to tie his shoe laces in a knot than to struggle through a bow, the knot is likely to win out.

Simple drill is generally the most effective way of building fluency with a skill. Just have the pupil perform the task over and over again. The problem with drill is that it can be very boring. If the pupil appears to be having difficulty during the fluency-building phase of learning, therefore, it will probably be necessary to arrange for more powerful reinforcers or consequences -- something to make the continued drill worthwhile to the child. Adding more instructional events (cues, prompts, etc.) may just compound the problem. After all, the child knows pretty well what to do, he or she just needs a reason for doing it.

## Identifying the Phase of Learning

Common sense might dictate that a pupil would be in the acquisition phase of learning until he or she was 100% successful in completing the task accurately, and then would pass into the fluency-building phase of learning. If that were the case, it would then be possible to decide which strategy would work by simply assessing the child's accuracy. Unfortunately, that is not the case. Most pupils begin to pass from acquisition into fluency building before all the steps in a task have been fully acquired. Just because a child does not know all the letters in the alphabet does not mean that he or she cannot begin to build fluency with those already learned. The pupil may even have actually acquired all the steps in a task, and simply make careless errors out of boredom. It is possible, therefore, that the child reaches a point where strategies appropriate for fluency building (increased consequation) become more important than strategies appropriate for acquisition (increased cues, and feedback) long before the pupil ever demonstrates 100% accuracy. Even if the teacher has no real interest in fluency, therefore, it may become necessary to attend to that phase of learning in order to reach a point where the pupil reliably demonstrates the skill with an acceptable level of accuracy. To complicate matters further, it is possible for a pupil to be 100% accurate on some tasks and still not really have acquired the desired skill. For example, rather than learning the value of a number, a child may use elaborate counting strategies to determine the time of day. So even if the pupil is 100% accurat, a continued emphasis on instruction (cues, prompts, feedback) may still be necesary.

Fortunately, things are not quite as hopeless as they might at first seem. There are some relatively simple rules for determining the phase of learning in which a pupil is currently developing and, thereby, for deciding which type of program revision is likely to be most effective in promoting continued learning. Before those rules can be employed, however, it will first be necessary to review a few procedures for describing the pupil's performance.

## Describing Patterns of Learning[5]

Four aspects of a pupil's performance will be important for evaluating his or her needs: the trend or progress in correct performance over the past six assessments; the variability in correct performances; the ratio of correct to incorrect performances; and the overall fluency (rate) of correct performances.

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[5] The patterns of learning described here are similar to the concept of "learning pictures" discussed by O.R. Lindsley at the Big Sky Precision Teaching Conference, Kalispell, Montana, Summer 1977.

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Trend in Correct Performances. A line should be drawn through the last six correct performances to indicate whether they are generally increasing, remaining essentially the same, or decreasing over time. The procedures which have proven most useful in drawing that line are as follows (see figure 3).

(1) Find the intersection of the middle-day and the middle-performance value for the most current three assessments on the chart. In other words, employ the procedures described earlier for finding a "start-mark", but use them with the last three assessments instead of the first three assessments on the chart.

(2) Find the intersection of the middle-day and middle-performance value for the next-most recent assessements (i.e., the fourth, fifth and sixth most recent assessments on the chart).

(3) Draw a straight line passing through the two intersections found in steps one and two, above. That line will, in most cases, be a fairly accurate estimate of how the correct performances were changing on the average over the past six assessments.

If the line of progress for the correct performances is going up or down the chart, it will be necessary to note whether the slope of that line is "steep." Generally, a trend can be considered steep if it represents a doubling (times-two) or halving (divide-by-two) in performance over any given week. As a point of reference, a straight line from the lower left-hand corner to the upper right-hand corner of the standard behavior chart represents a times-two line (doubling each week); and a line drawn from the upper left-hand corner to the lower right-hand corner represents a divide-by-two line (halving each week)(see figure 4). By drawing or visualizing those lines on the chart, it is relatively simple to compare the pupil's actual trend with those standards and determine whether the change in correct performances can be considered "steep."

Variability. Most children have "good days" or "bad days," but overall, the change in performance from day-to-day should be relatively consistent and stable. It if is not, then serious questions arise concerning the "power" of the instructional program to solicit the pupil's attention and best performances. That will be an important consideration when selecting intervention strategies for improving a program. If the standard behavior chart is being used, there is a simple procedure for deciding whether a pupil's performance patterns are reasonably stable -- simply place a standard wooden pencil on top of the line of progress and move it up or down to cover as many of the correct performances as possible. If it is possible to cover all but one or two of the correct performances in a one or two week period, then the pupil's performance pattern can be considered reasonably stable. If several correct performances "peek out" from under the pencil, however, then the pupil's variability should be considered unacceptably high (see figure 5).

Accuracy. Although most of the information required to accurately identify a pupil's phase of learning relate only to his or her correct performances, some information will also be required concerning the relationship of correct to error performances. Percentage statements could be calculated for each assessment, but fortunately, if the standard behavior chart is being used, there is a simpler way. Only one of two accuracy levels is likely to be important for determining a pupil's phase of learning -- 83% or 67%, depending upon the type of skill or pupil involved. Those two proportions represent ratios of five corrects to one error, and two corrects to one error, respectively. The distance on the standard behavior chart which those ratios represent can be easily determined by looking at the left-hand scale. Whenever correct and error performances are as far apart as the one and the five lines, the pupil is at least 83% accurate. Whenever they are as far apart as the one and the two linesof the chart, the pupil is at least 67% accurate. By marking those distances on a slip of paper, and then passing the paper over the pupil's rates, it can be easily determined whether the pupil has met either of those basic accuracy standards (see figure 6).

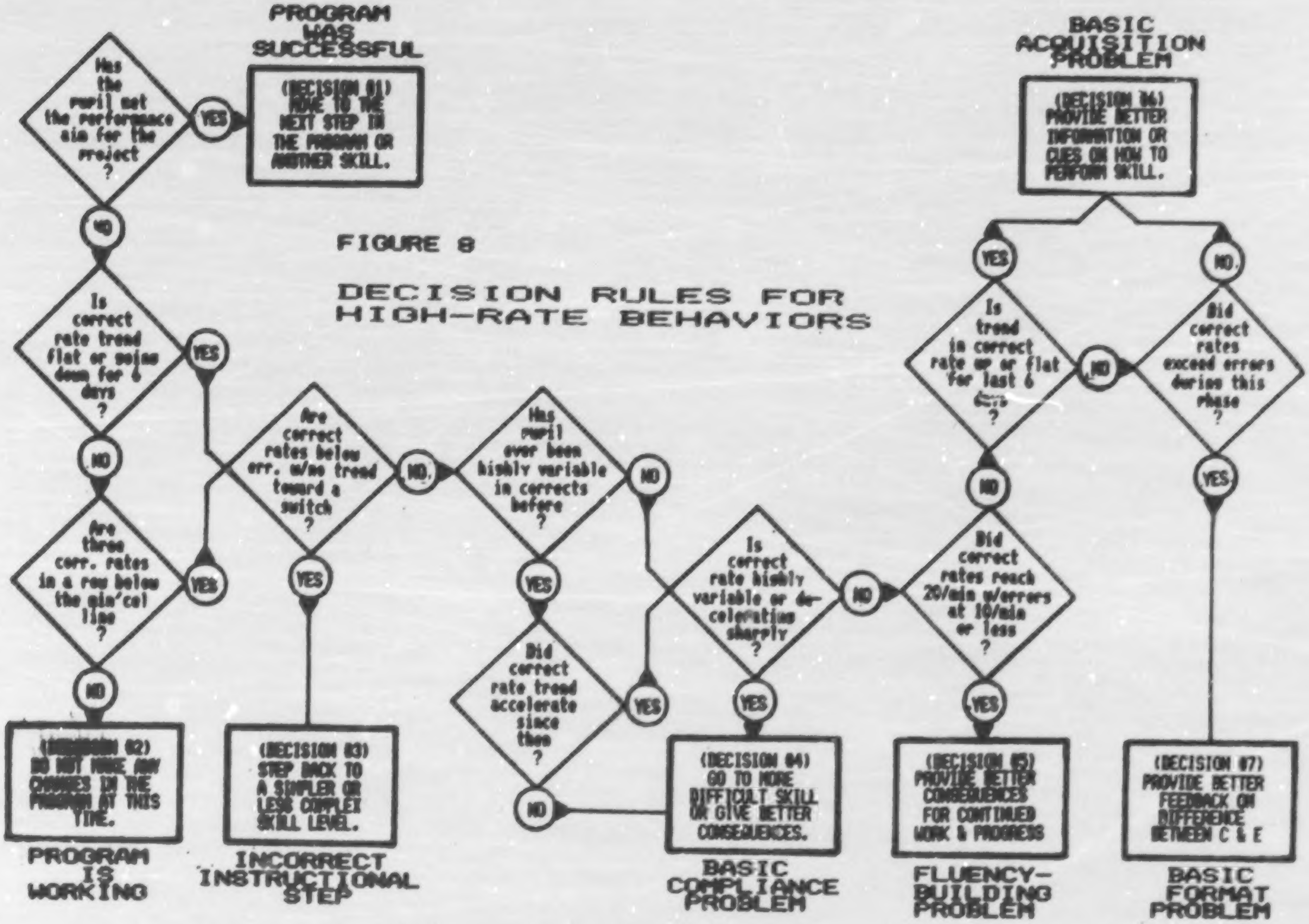
PROGRAM WAS SUCCESSFUL
Has the pupil met the performance aim for the project ?
YES
(DECISION 01) MOVE TO THE NEXT STEP IN THE PROGRAM OR ANOTHER SKILL.
NO
Is correct rate trend flat or going down for 6 days ?
YES
NO
Are three corr. rates in a row below the min'col line ?
YES
NO
(DECISION 02) DO NOT MAKE ANY CHANGES IN THE PROGRAM AT THIS TIME.
PROGRAM IS WORKING
Are correct rates below err. w/no trend toward a switch ?
YES
(DECISION 03) STEP BACK TO A SIMPLER OR LESS COMPLEX SKILL LEVEL.
INCORRECT INSTRUCTIONAL STEP
NO.
Has pupil ever been highly variable in corrects before ?
YES
NO
Did correct rate trend accelerate since then ?
YES
NO
Is correct rate highly variable or decelerating sharply ?
YES
(DECISION 04) GO TO MORE DIFFICULT SKILL OR GIVE BETTER CONSEQUENCES.
BASIC COMPLIANCE PROBLEM
NO
Did correct rates reach 20/min w/errors at 10/min or less ?
YES
(DECISION 05) PROVIDE BETTER CONSEQUENCES FOR CONTINUED WORK & PROGRESS
FLUENCY-BUILDING PROBLEM
NO
Is trend in correct rate up or flat for last 6 days ?
YES
BASIC ACQUISITION PROBLEM
(DECISION 06) PROVIDE BETTER INFORMATION OR CUES ON HOW TO PERFORM SKILL.
NO
Did correct rates exceed errors during this phase ?
NO.
YES
(DECISION 07) PROVIDE BETTER FEEDBACK ON DIFFERENCE BETWEEN C & E
BASIC FORMAT PROBLEM

FIGURE 8

DECISION RULES FOR HIGH-RATE BEHAVIORS

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Correct Rate. While it may seem reasonable that a pupil's correct rate should have some relationship to the point when he or she begins to make the transition from acquisition to fluency-building, one would not expect that transition point to fall at the same rate for skills which have differing fluency standards. For example, children are usually not considered fluent in saying the alphabet until they can recite it at about 150 to 200 letters per minute (i.e., saying the whole alphabet in eight or nine seconds), but a young deaf child might be considered acceptably fluent in signing with a correct rate of only 50 or 60 per minute. One would expect, therefore, that children would begin to make the transition into fluency building with the alphabet at a higher rate than with signing. That doesn't seem to be the case. If the child is "physically intact" (i.e., is physically capable of normal rates of performance), and the skill in question is one which a normal, fluent adult is likely to perform at a rate of 40 per minute or more, then the transition from acquisition to fluency building is likely to take place when the correct rates are somewhere around 20 per minute. That rule seems to work for a very wide range of skills -- from steps taken while walking, to oral reading; and from sorting blocks to making complex signs. If the skill being taught is one which a normal fluent adult is able to perform at a rate of 40 per minute or more, therefore, it will often be necessary to know whether the pupil has ever achieved a correct rate close to 20 per minute.

## The Decision Rules

Once the pupil's performances have been described in terms of the variables outlined above, it should be possible to make a fairly accurate determination of the pupil's current phase of learning and, in turn, to choose the instructional strategy which is most likely to promote continued learning. Two sets of rules exist. The first set of rules was developed during the mid-nineteen seventies through an analysis of learning records from classrooms serving learning disabled children (White & Liberty, 1976; Haring & White, 1980). Later, the predictive validity of those rules were tested and found to work well with the progress records of several thousand normal children (Sokolove, note 5).

When those rules were applied in classrooms serving the severely handicapped, three problems were encountered (Haring, Liberty & White, note 4). First, many of the instructional targets in classrooms serving the severely handicapped cannot be performed at the same high rates as those found in classrooms serving the mildly handicapped or normal pupil (e.g., children simply cannot tie shoes as rapidly as they might write letters or say words). Rules concerning the transition from acquisition to fluency building based on the rates of mildly handicapped pupils could not, therefore, be applied to many programs developed for the severely handicapped. Secondly, although mildly handicapped and normal children appear to be able to begin building fluency when a relatively small proportion of a task has been acquired (i.e., when they are about 67% accurate), more severely handicapped pupils apparently need to have acquired a larger proportion of the task before building fluency becomes of prime importance (i.e., they need to achieve about 83% accuracy). Finally, a relatively large proportion of the severely handicapped pupils studied displayed a great deal of variability in their performances from day to day. Such children tended to be unpredictable until special programs were developed to make them more "compliant" and responsive to the instructional situation. In order to adequately account for the range of situations which a teacher might encounter, therefore, it will be necessary to present two sets of rules.

Despite the background leading up to the two sets of rules, the decision to use one set or the other need not depend on the level of severity of the pupil's handicap. Many severely handicapped pupils appear to follow the rules originally developed for the mildly handicapped, and it is quite possible that even a program developed for a normal pupil would best fit the rules originally developed for the severely handicapped. The "rules for picking the rules," as it were, are relatively simple:

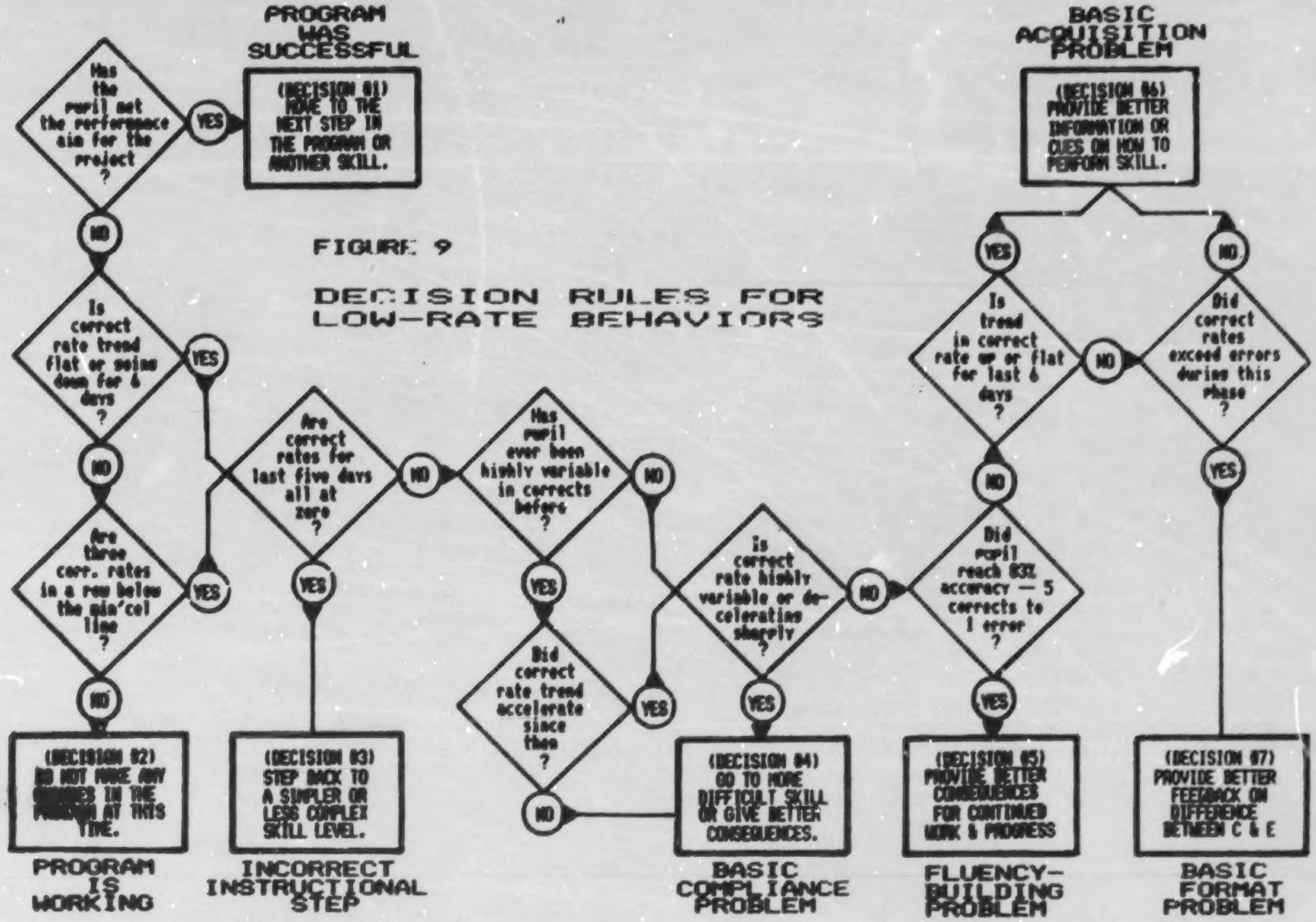
PROGRAM WAS SUCCESSFUL
Has the pupil met the performance aim for the project ?
YES
(DECISION #1) MOVE TO THE NEXT STEP IN THE PROGRAM OR ANOTHER SKILL.
NO
Is correct rate trend flat or going down for 6 days ?
YES
NO
Are three corr. rates in a row below the min/cel line ?
YES
NO
(DECISION #2) DO NOT MAKE ANY CHANGES IN THE PROGRAM AT THIS TIME.
PROGRAM IS WORKING
Are correct rates for last five days all at zero ?
YES
(DECISION #3) STEP BACK TO A SIMPLER OR LESS COMPLEX SKILL LEVEL.
INCORRECT INSTRUCTIONAL STEP
NO
Has pupil ever been highly variable in corrects before ?
YES
Did correct rate trend accelerate since then ?
YES
NO
NO
Is correct rate highly variable or decelerating sharply ?
YES
(DECISION #4) GO TO MORE DIFFICULT SKILL OR GIVE BETTER CONSEQUENCES.
BASIC COMPLIANCE PROBLEM
NO
Did pupil reach 83% accuracy — 5 corrects to 1 error ?
YES
(DECISION #5) PROVIDE BETTER CONSEQUENCES FOR CONTINUED WORK & PROGRESS
FLUENCY-BUILDING PROBLEM
NO
Is trend in correct rate up or flat for last 6 days ?
YES
NO
Did correct rates exceed errors during this phase ?
NO
YES
BASIC ACQUISITION PROBLEM
(DECISION #6) PROVIDE BETTER INFORMATION OR CUES ON HOW TO PERFORM SKILL.
(DECISION #7) PROVIDE BETTER FEEDBACK ON DIFFERENCE BETWEEN C & E
BASIC FORMAT PROBLEM

FIGURE 9

DECISION RULES FOR LOW-RATE BEHAVIORS

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1) If the skill is of the type that a normal, fluent adult can perform at a rate of 40 per minute or more, and the pupil is physically intact, then use the rules shown in figure 8.
2) If the skill cannot be performed by a normal adult at a rate of 40 per minute or more, or if the pupil is physically disabled in a way that would prevent him or her from attaining normal fluency, then use the rules shown in figure 9.

## Do the Rules Work?

Yes, both sets of rules appear to allow relatively precise predictions about the success or failure of various instructional strategies in promoting continued child progress. For example, Sokolove (note 4) found that the first set of rules (figure 8) appeared to predict the direction of future pupil progress in all but 76 cases out of approximately 3300 instructional programs conducted with normal children. With the second set of rules (figure 9), Haring, Liberty & White (note 4) demonstrated that some 31 teachers serving the severely handicapped were more than 2.2 times more successful in picking successful remediation strategies when they used the rules than when they did not. Moreover, of those teachers who actually tried the rules in their classrooms during the Haring, Liberty & White study, 93% found the rules valuable enough to express a desire to continue their use after the study had ended and they no longer received any special encouragement or support from the project staff.

That does not mean that the rules are attractive enough to generate the immediate interest of all teachers. Although 93% of the teachers who actually tried the rules continued to use them, those teachers only represented 43% of all teachers originally asked to participate in the study. Why did more than half of the teachers who were approached decline to try the rules? That's difficult to say with any certainty, but its very likely to have something to do with the basic requirements for collecting and charting the type of data required to use the rules. Undoubtedly, many teachers would need to restructure at least part of their daily routine in order to meet those requirements. Based on the available data the eventual impact of that transition could very well be a savings in time and effort for both the teacher and the pupil, but it would appear that we must continue to search for ways of making the rules simple or attractive enough to make more teachers decide to give the rules a try.

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5. Sokolove. Personal communication, Summer 1977.

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# APPENDIX D

## Performance records for all-day compliance programs

KEY TO PHASE CONDITIONS:

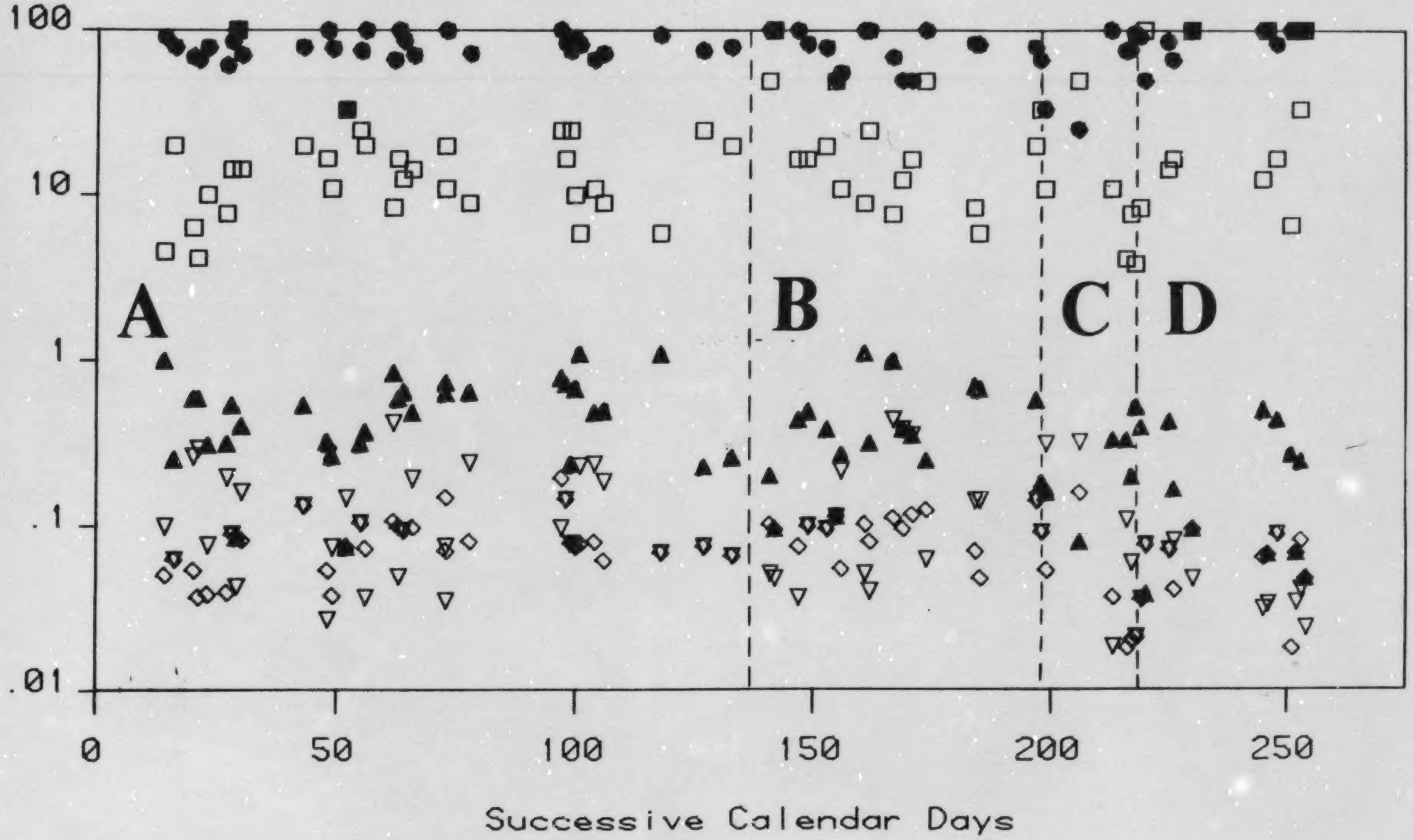
A: Baseline, Teachers consequate compliance and noncompliance in any fashion they desire (generally, repeating commands for noncompliance; ignoring compliance)

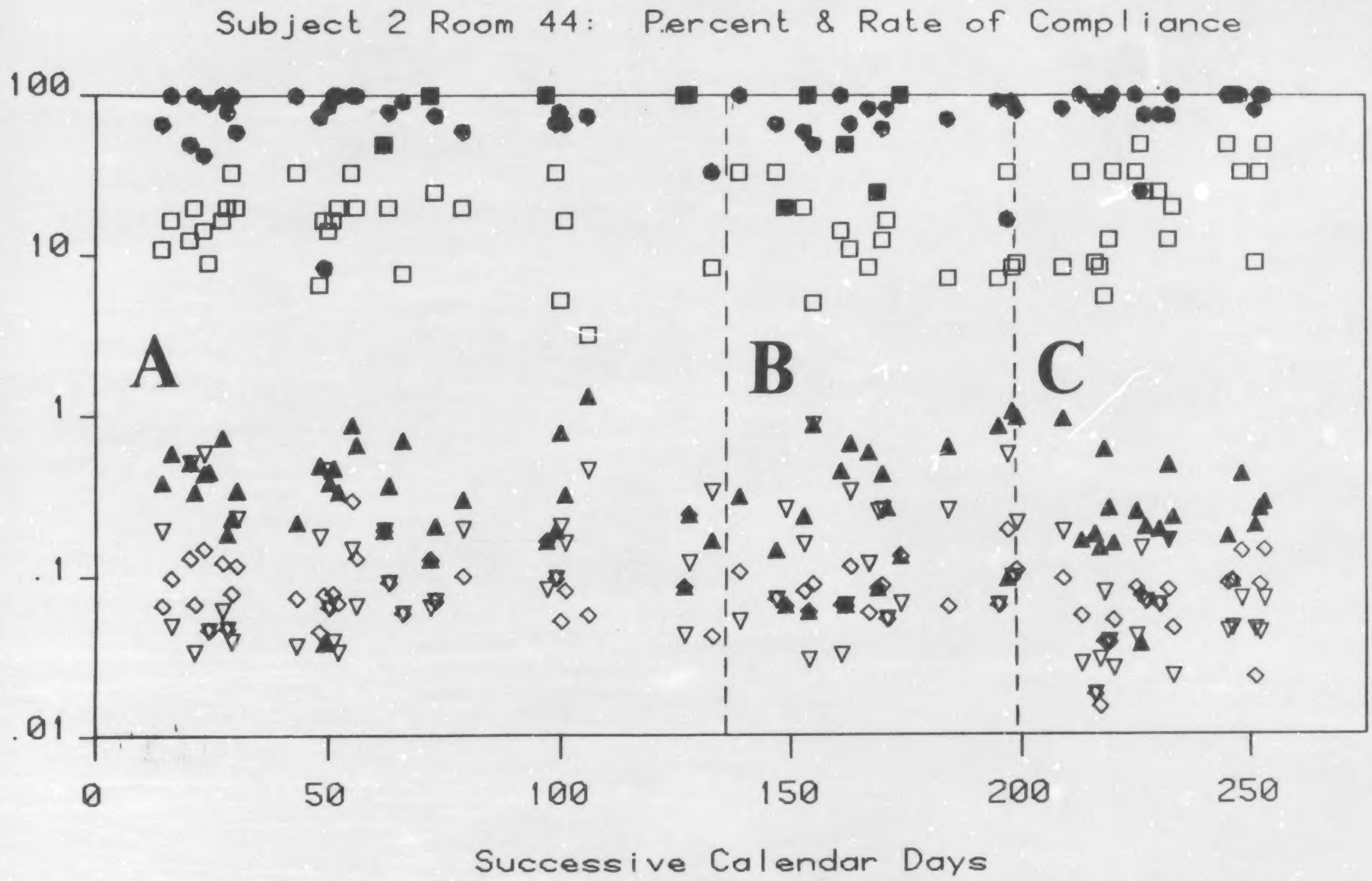
B: Teachers are requested to praise compliance and ignore or mandate noncompliance (but teacher reliability in doing so extremely poor)

C: Teachers provided with specific demonstrations of how to praise compliance

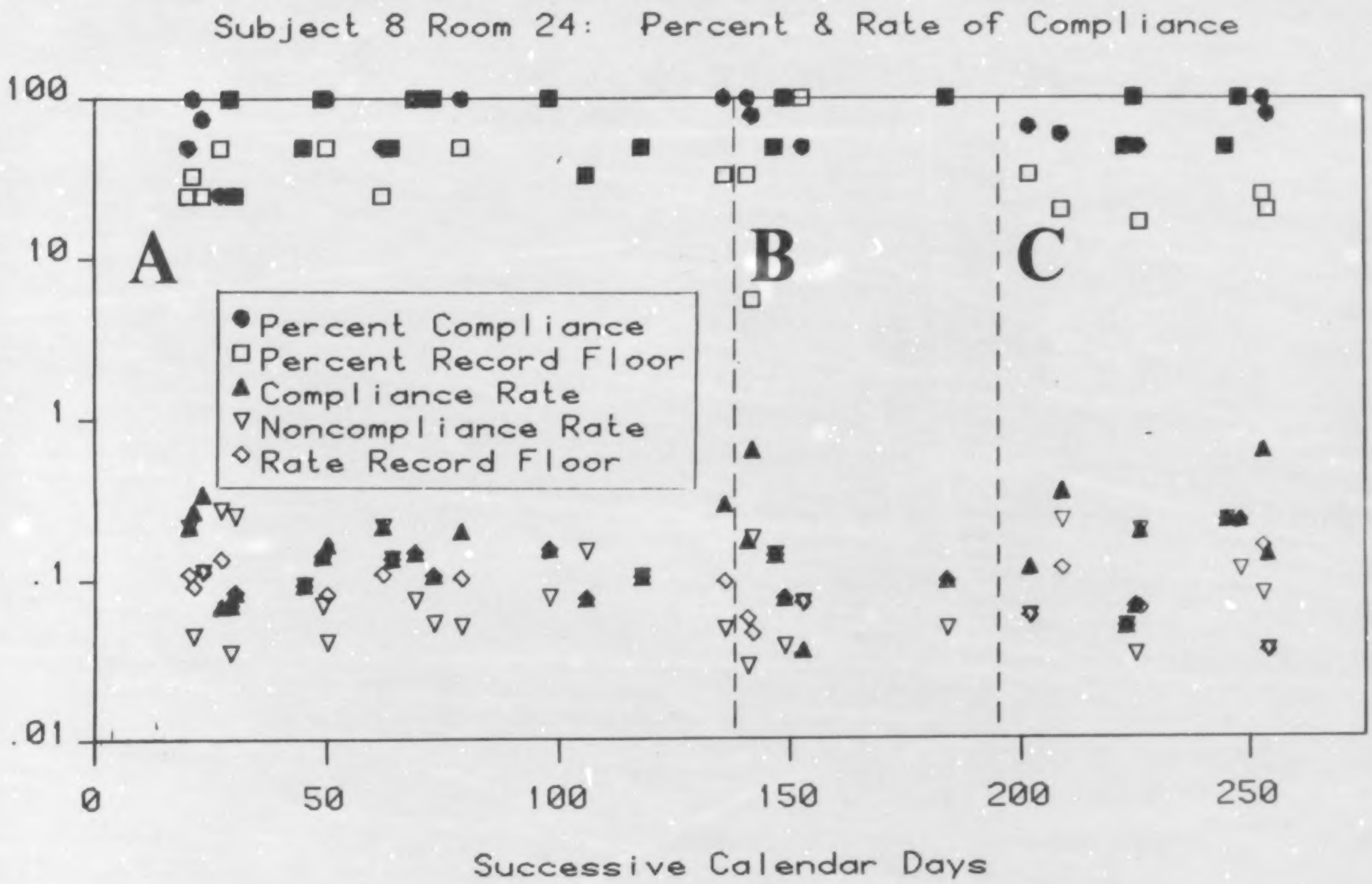
D: (Subject 2, room 24 only) Teachers asked to stop praising compliance (i.e., withdrawal of condition B)

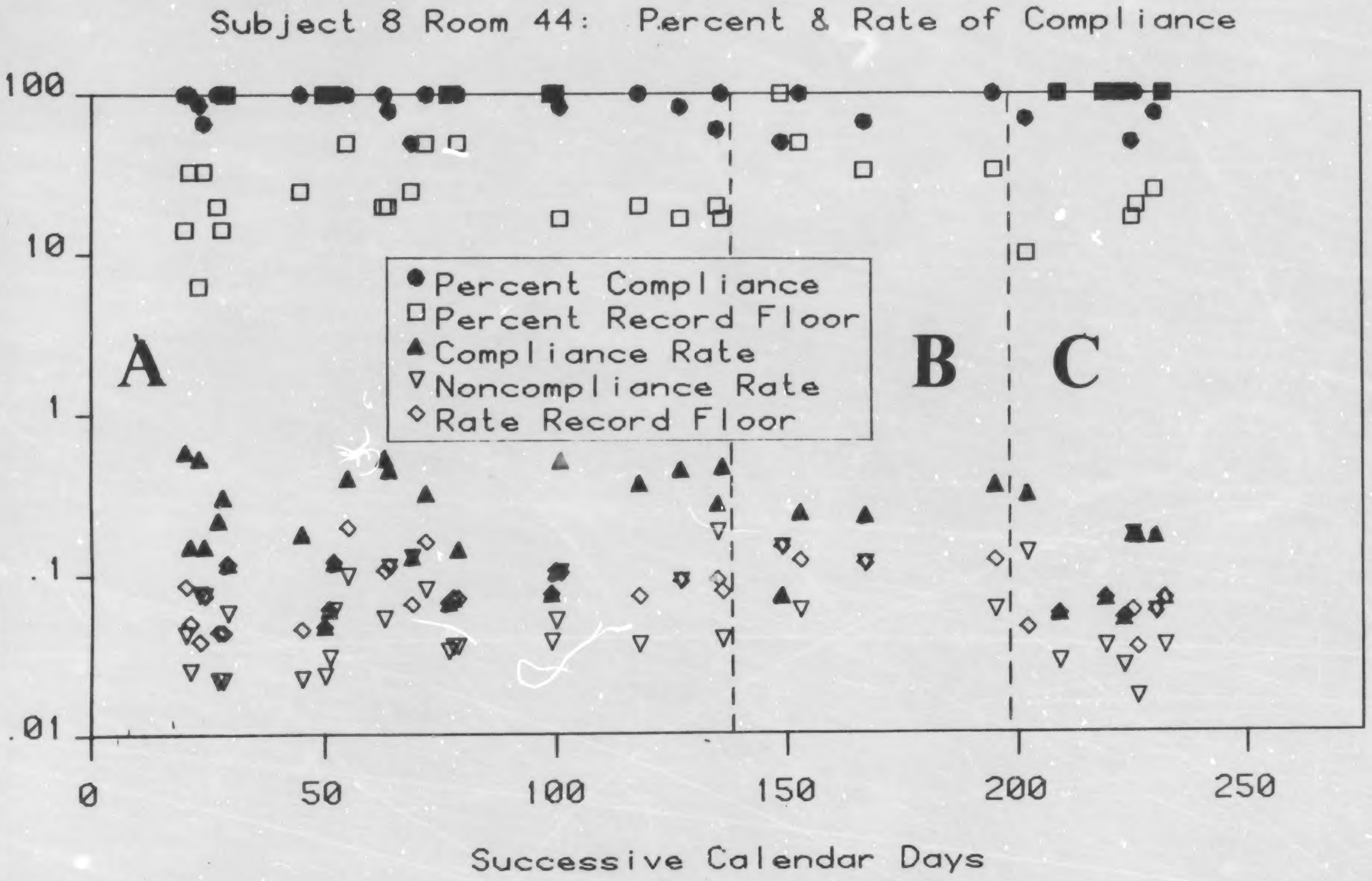
Subject 2 Room 24:  Percent & Rate of Compliance





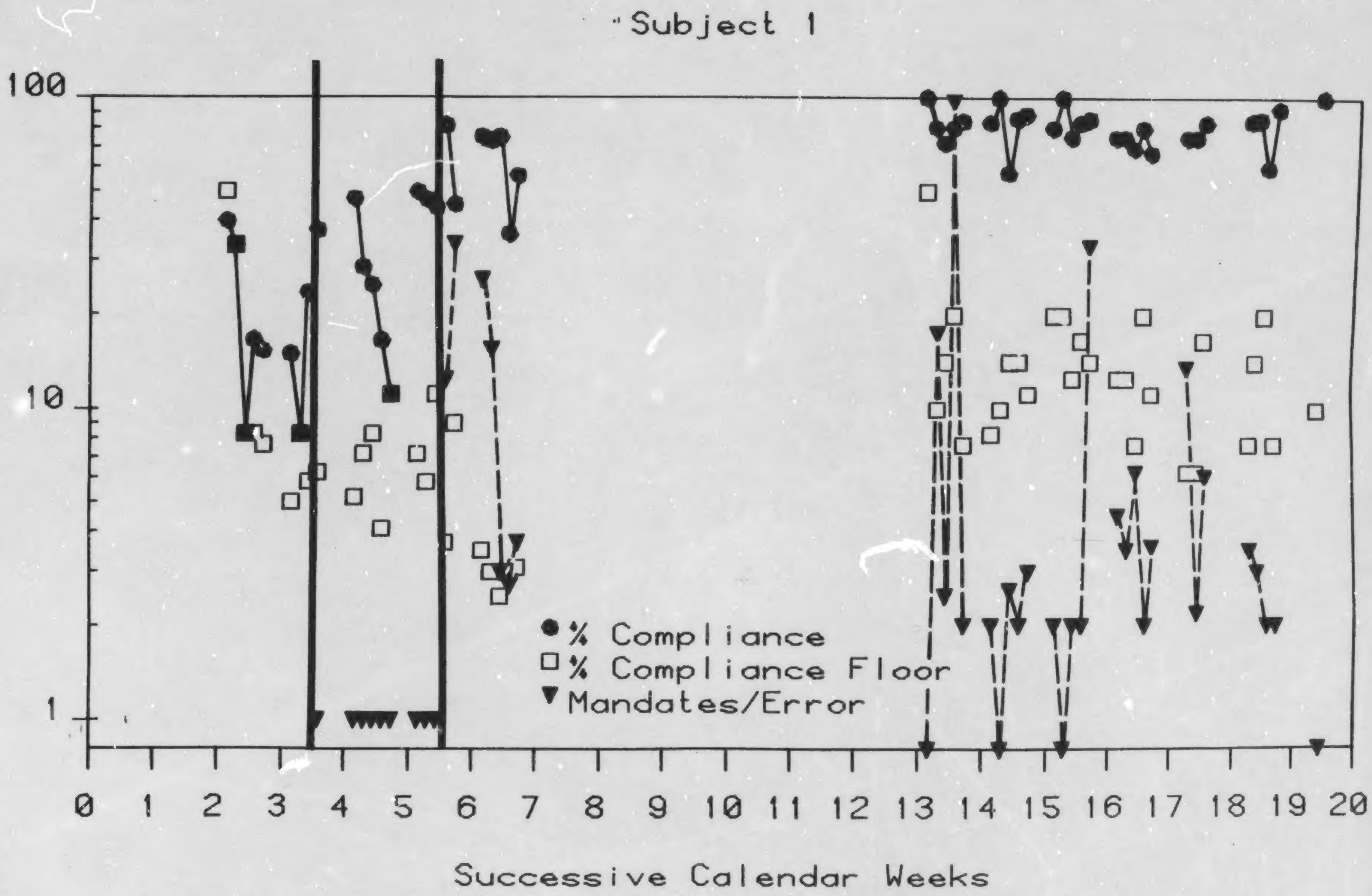
Subject 2 Room 44: Percent & Rate of Compliance


Subject 8 Room 24: Percent & Rate of Compliance
100
10
1
.1
.01
A
B
C
● Percent Compliance
□ Percent Record Floor
▲ Compliance Rate
▽ Noncompliance Rate
◇ Rate Record Floor
0
50
100
150
200
250
Successive Calendar Days

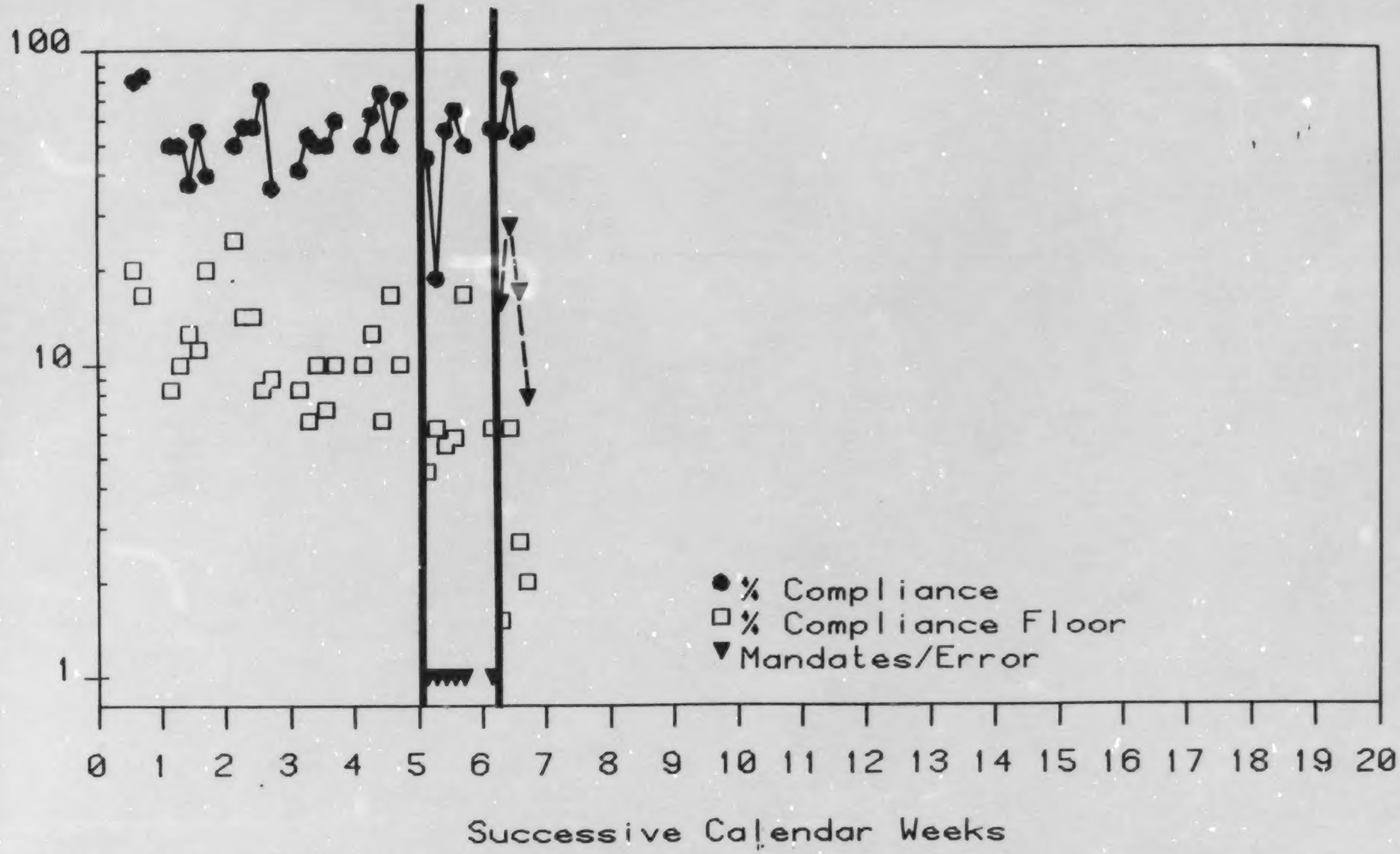

Subject 8 Room 44: Percent & Rate of Compliance
100
10
1
.1
.01
0
50
100
150
200
250
Successive Calendar Days
● Percent Compliance
□ Percent Record Floor
▲ Compliance Rate
▽ Noncompliance Rate
◇ Rate Record Floor
A
B
C

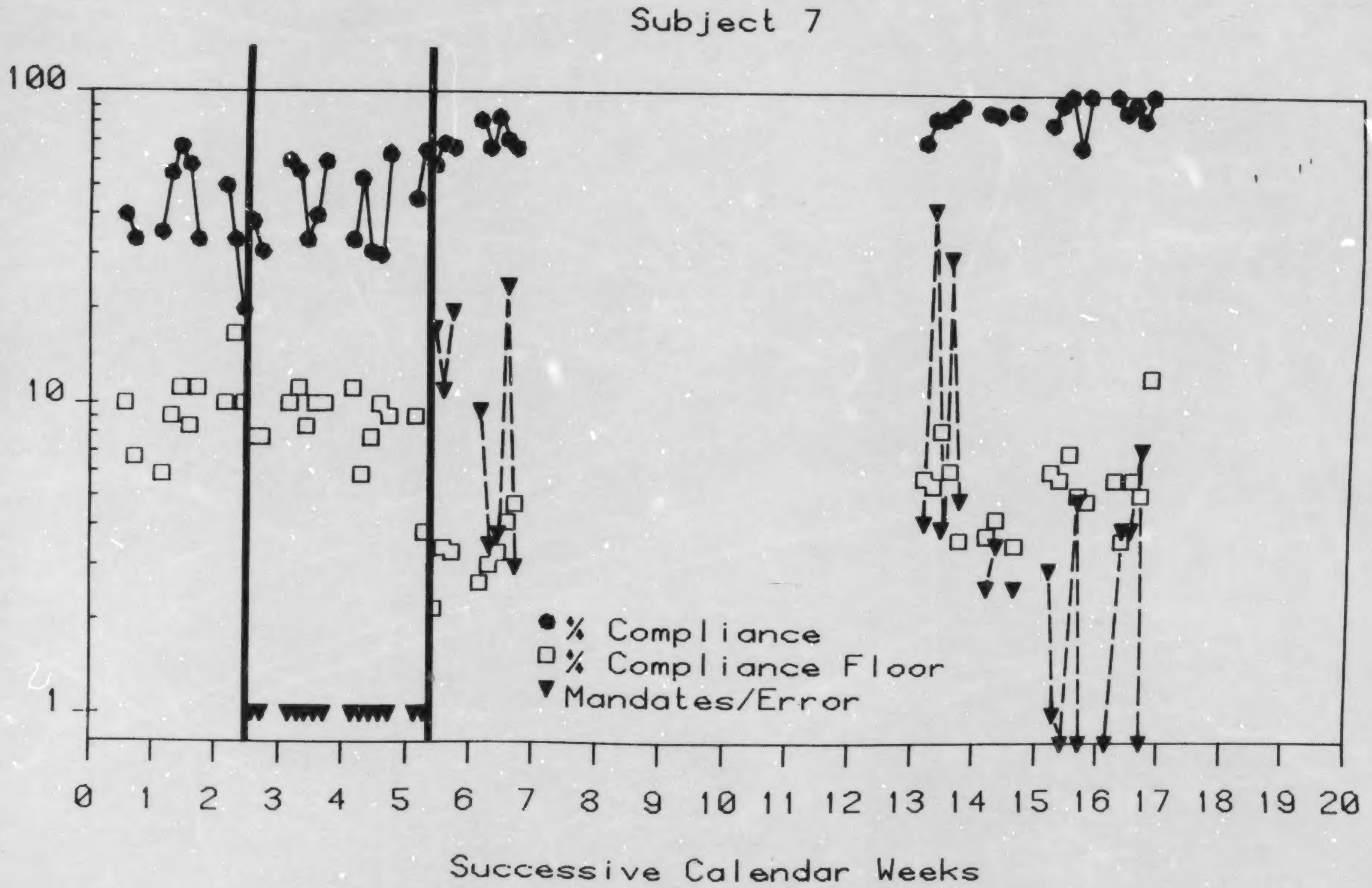
# APPENDIX E

## Performance records for repeated-mandate study


Subject 1
100
10
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Successive Calendar Weeks
● % Compliance
□ % Compliance Floor
▼ Mandates/Error

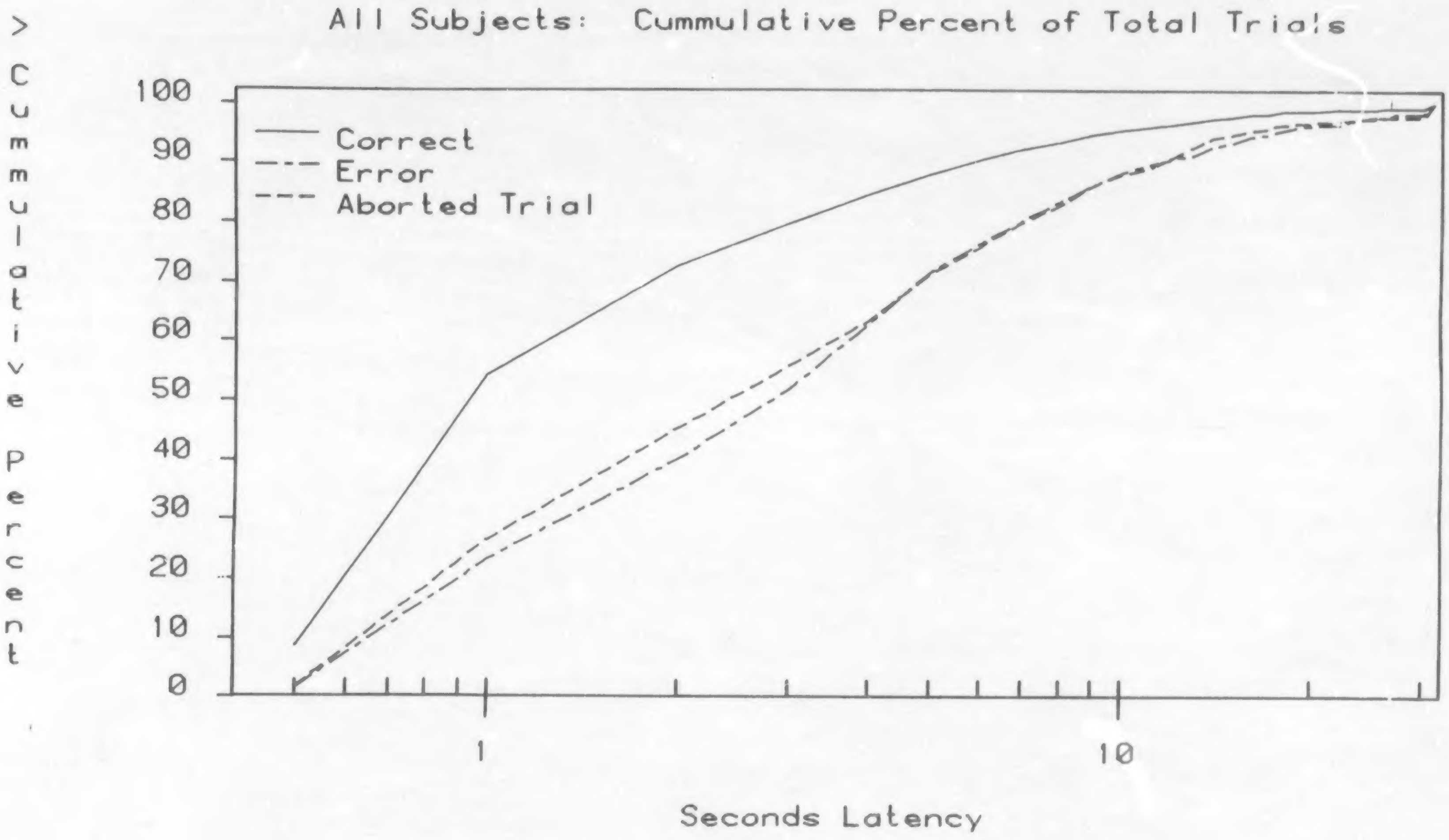
## Subject 5


100
10
1
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Successive Calendar Weeks
● % Compliance
□ % Compliance Floor
▼ Mandates/Error

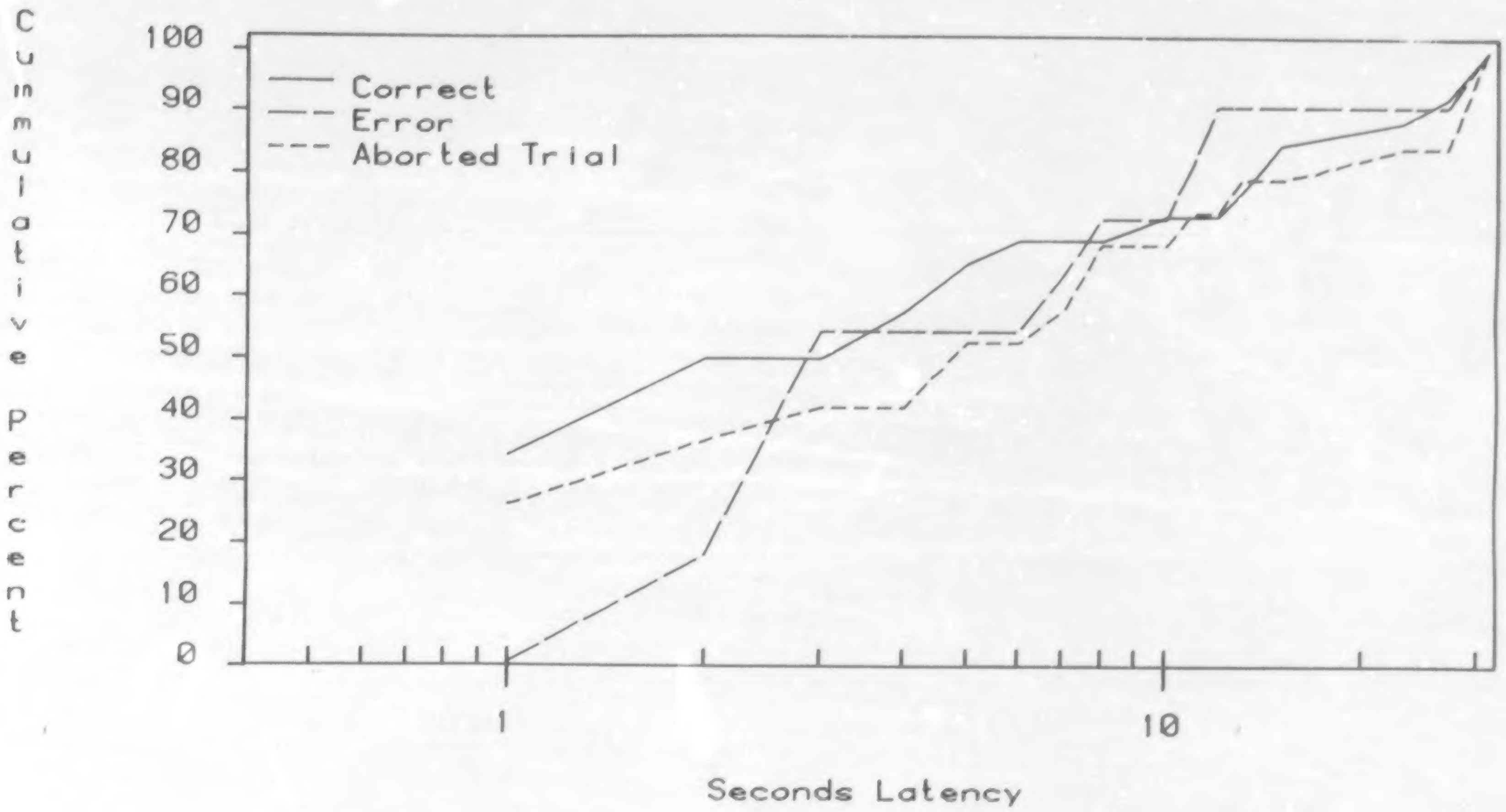

Subject 7
100
10
1
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
● % Compliance
□ % Compliance Floor
▼ Mandates/Error
Successive Calendar Weeks

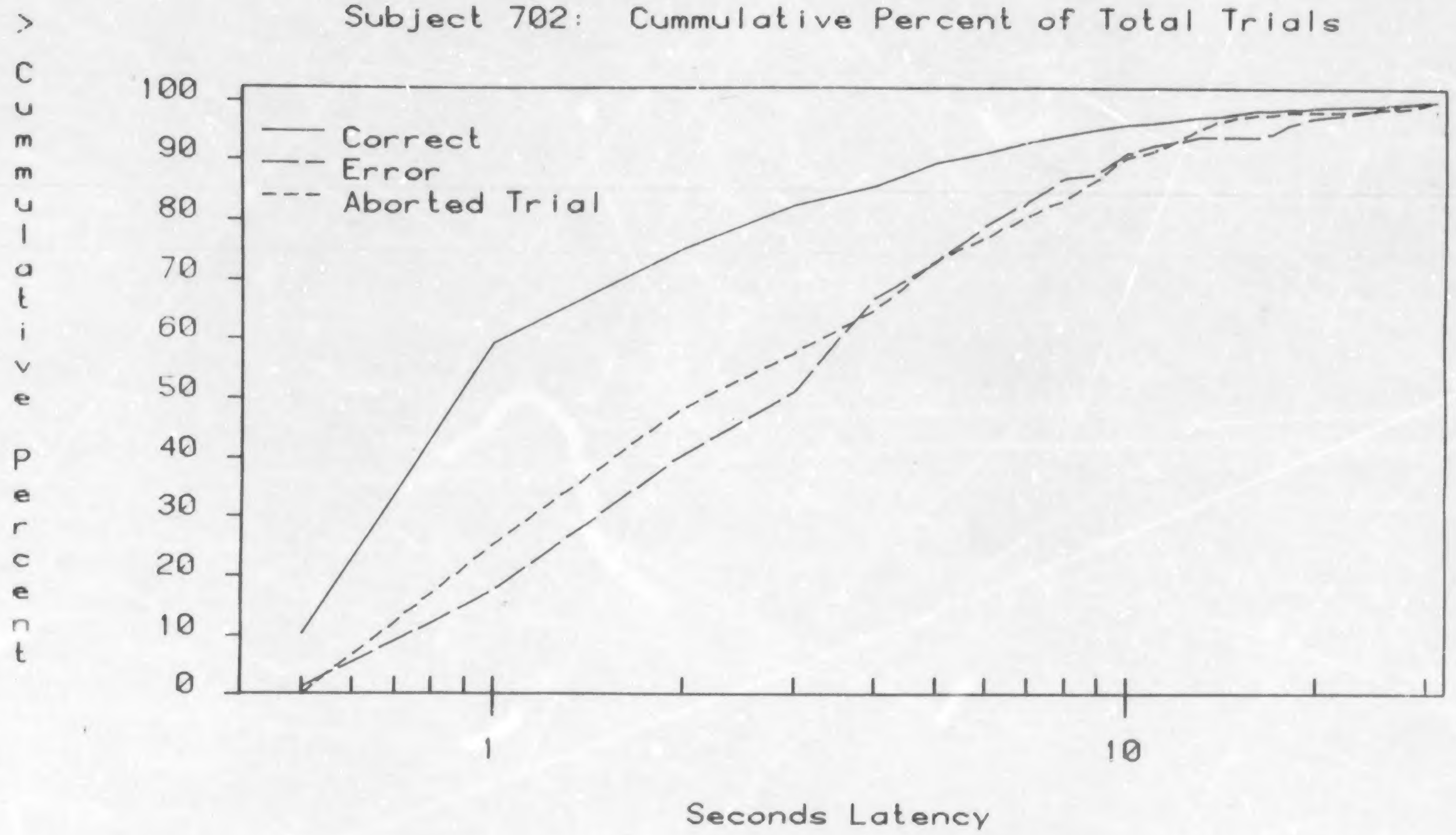
# APPENDIX F

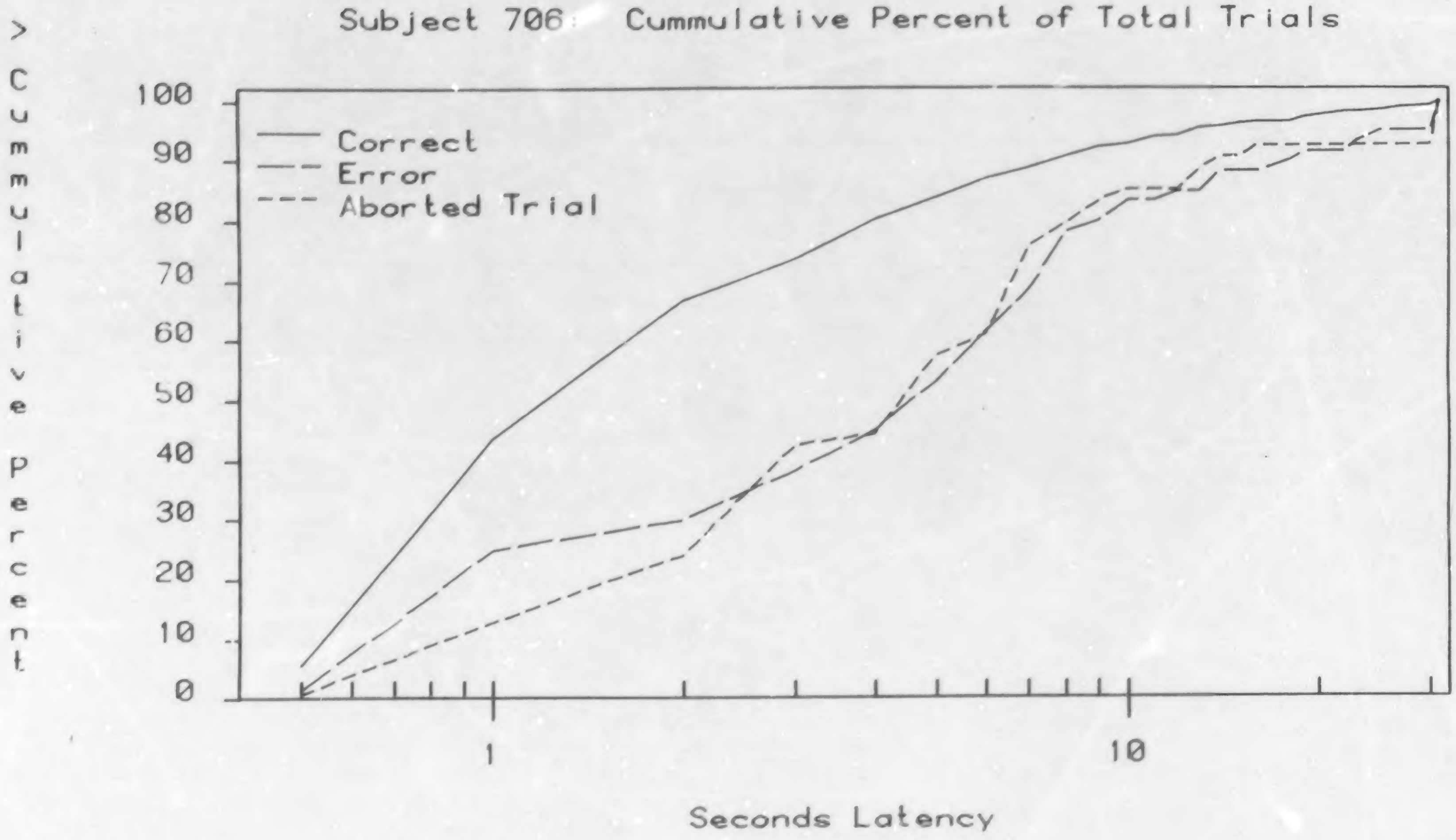
## Latency Analysis Charts

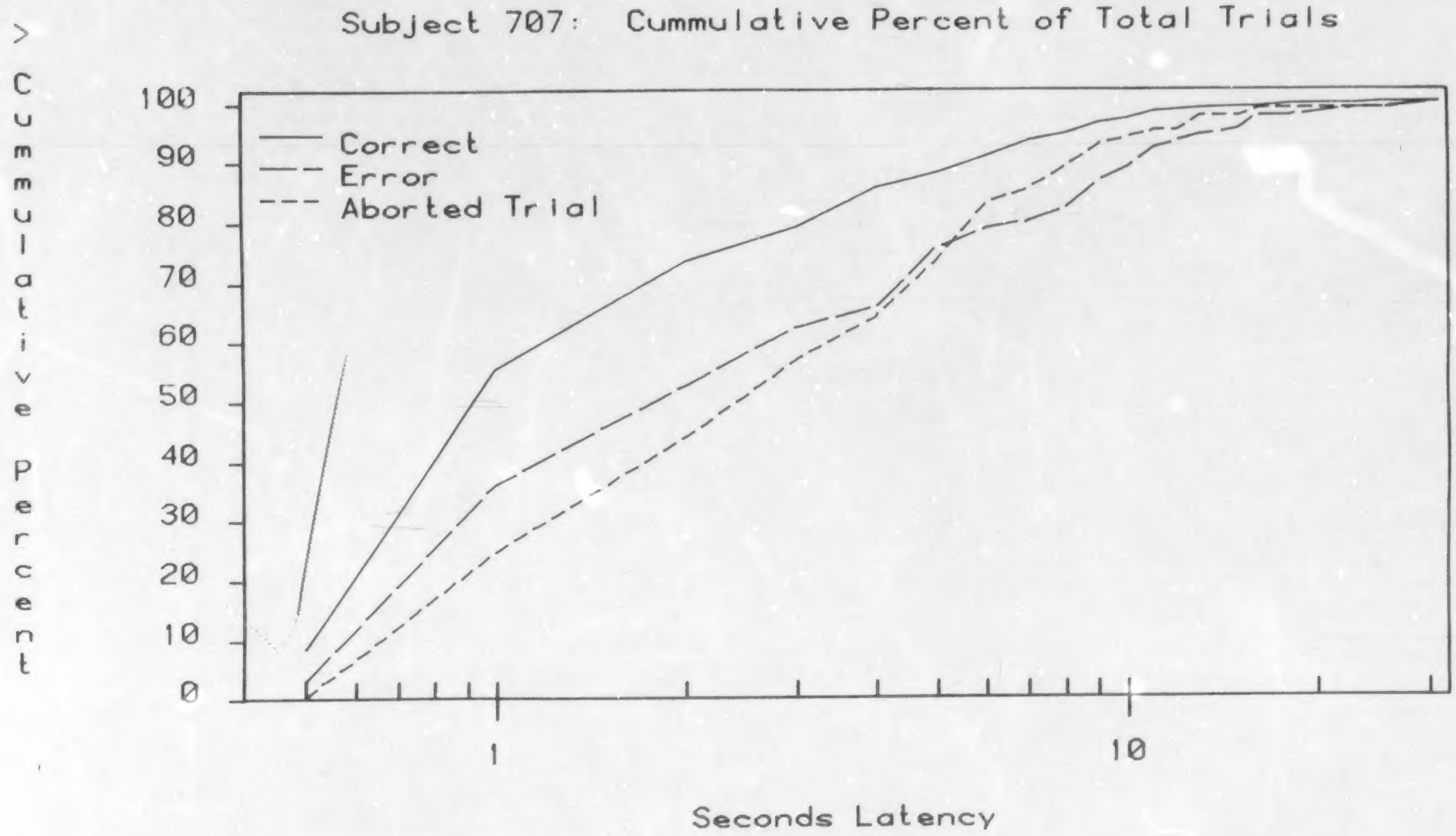

All Subjects: Cummulative Percent of Total Trials
> Cummulative Percent
0
10
20
30
40
50
60
70
80
90
100
Correct
Error
Aborted Trial
1
10
Seconds Latency

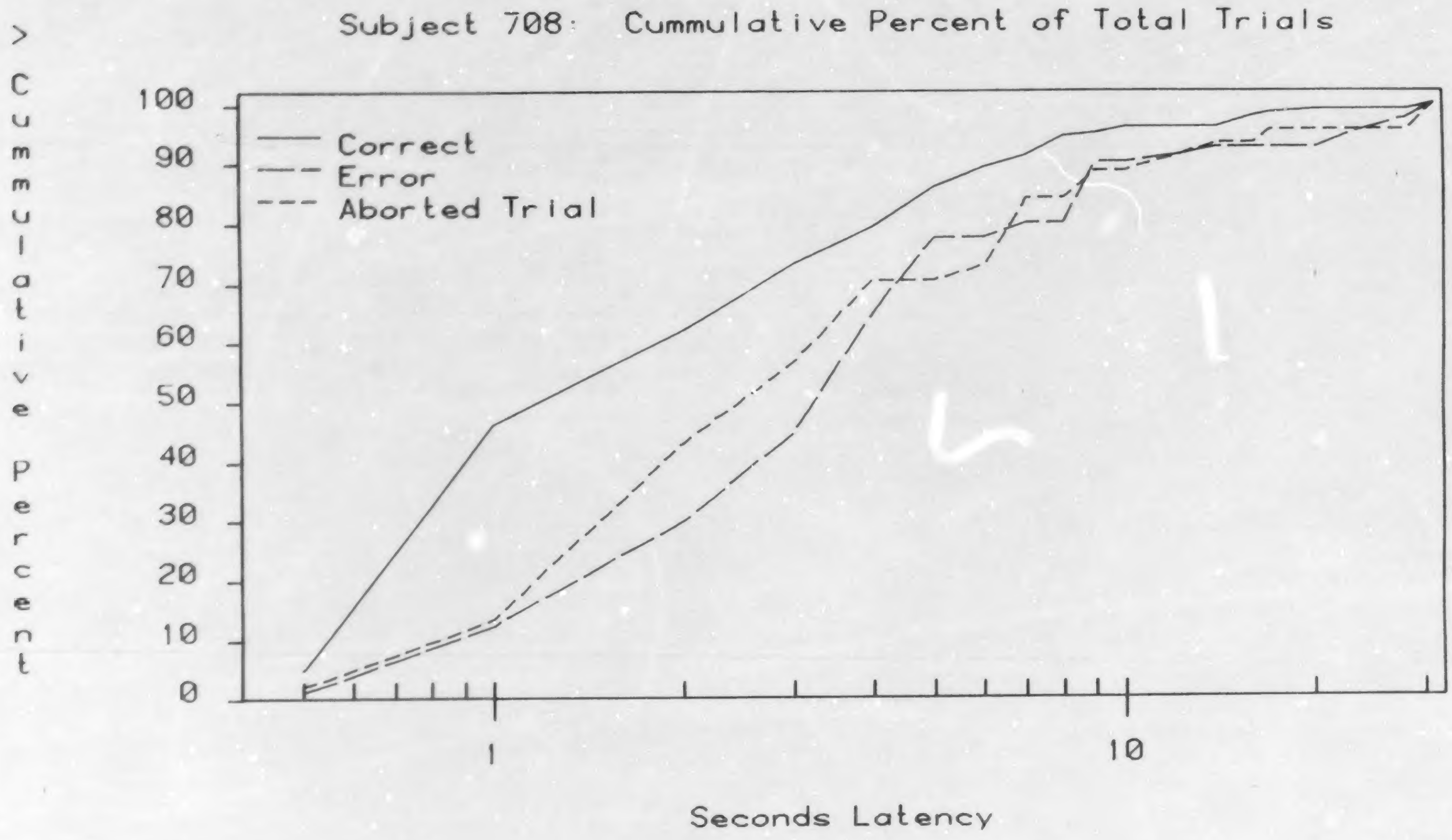
Subject 403: Cummulative Percent of Total Responses

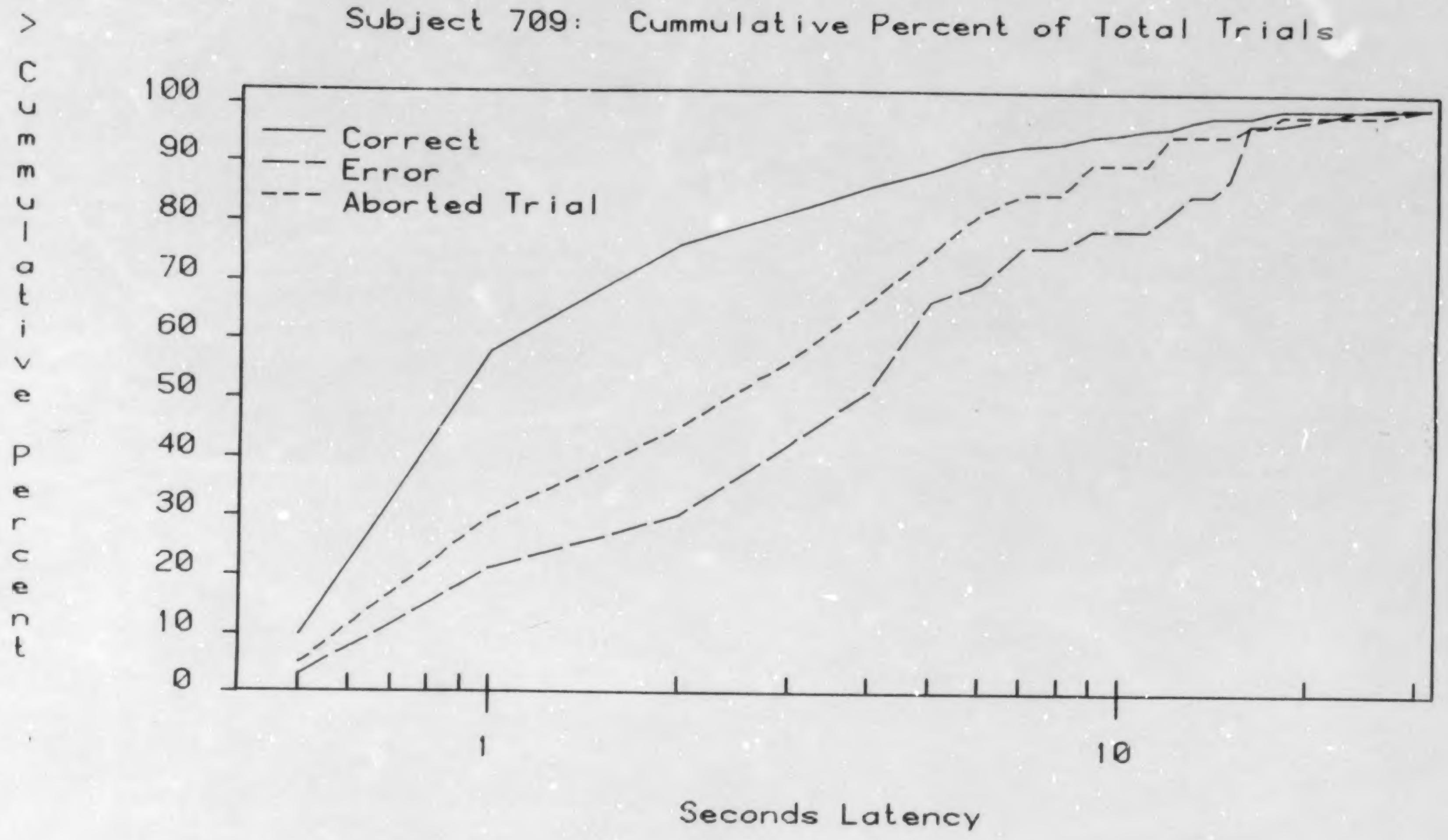


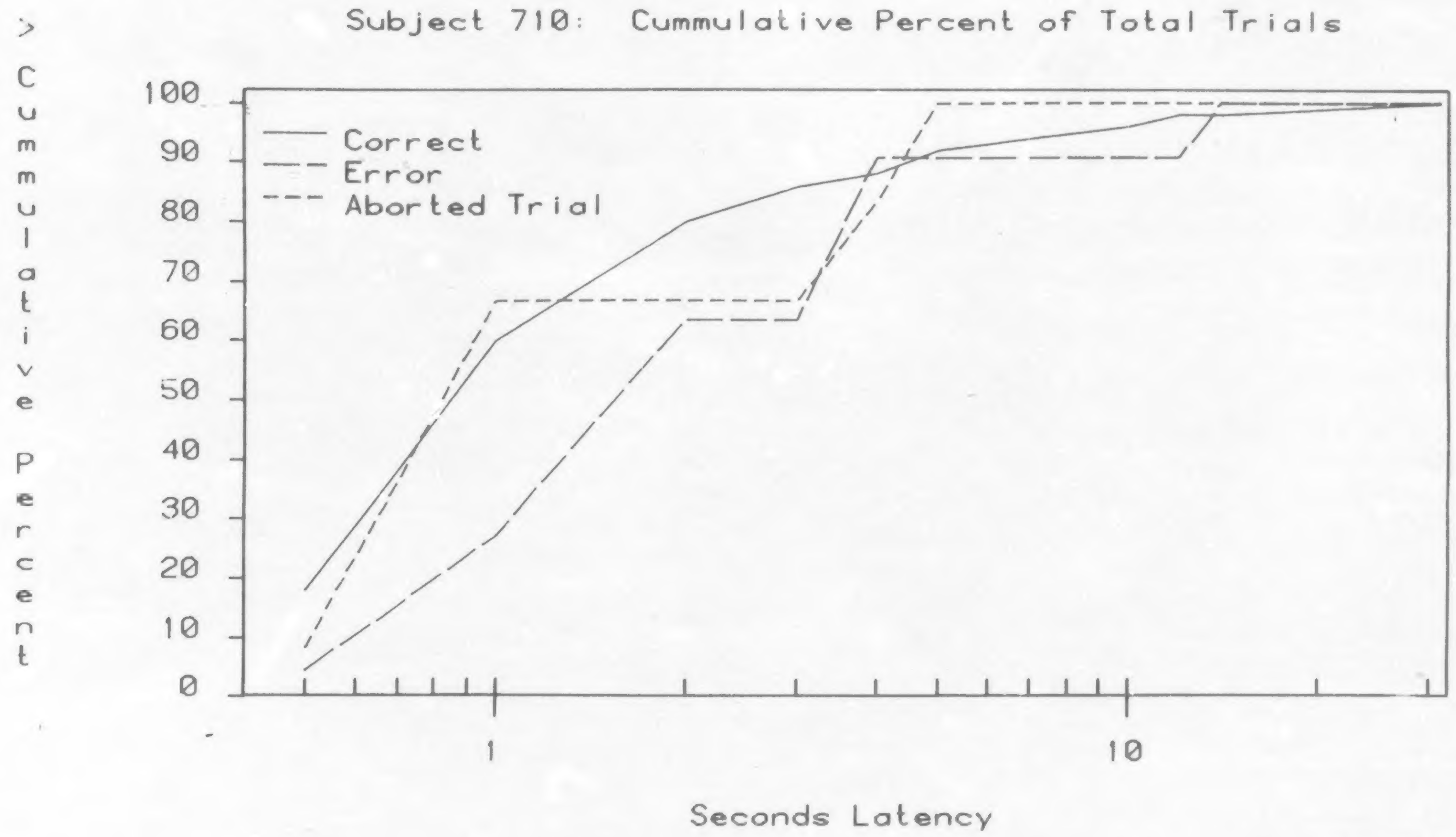

Subject 702: Cummulative Percent of Total Trials
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
Correct
Error
Aborted Trial
1
10
Seconds Latency


Subject 706: Cummulative Percent of Total Trials
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
Correct
Error
Aborted Trial
1
10
Seconds Latency

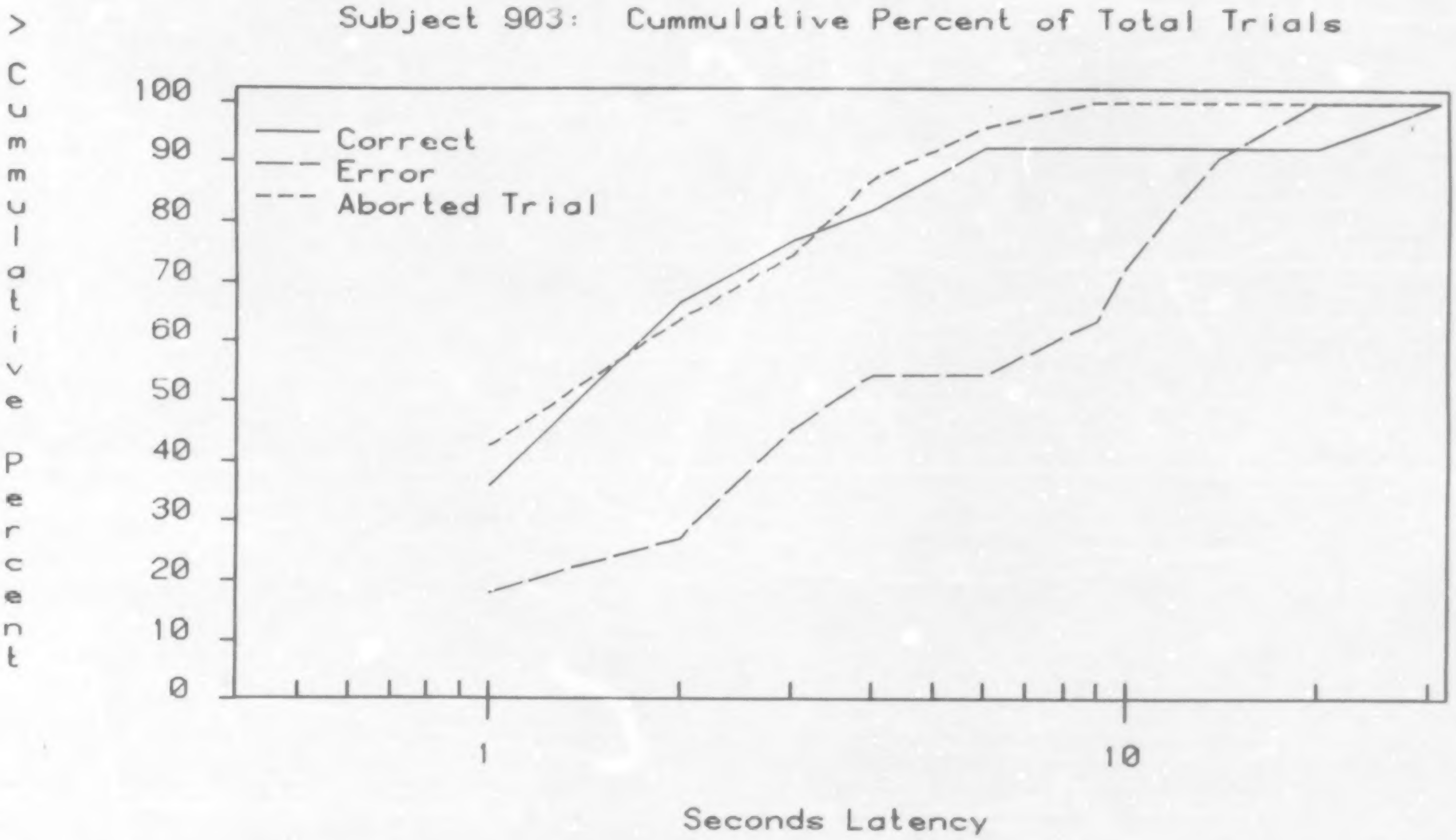

Subject 707: Cummulative Percent of Total Trials
Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
Correct
Error
Aborted Trial
1
10
Seconds Latency


Subject 708: Cummulative Percent of Total Trials
Correct
Error
Aborted Trial
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
1
10
Seconds Latency

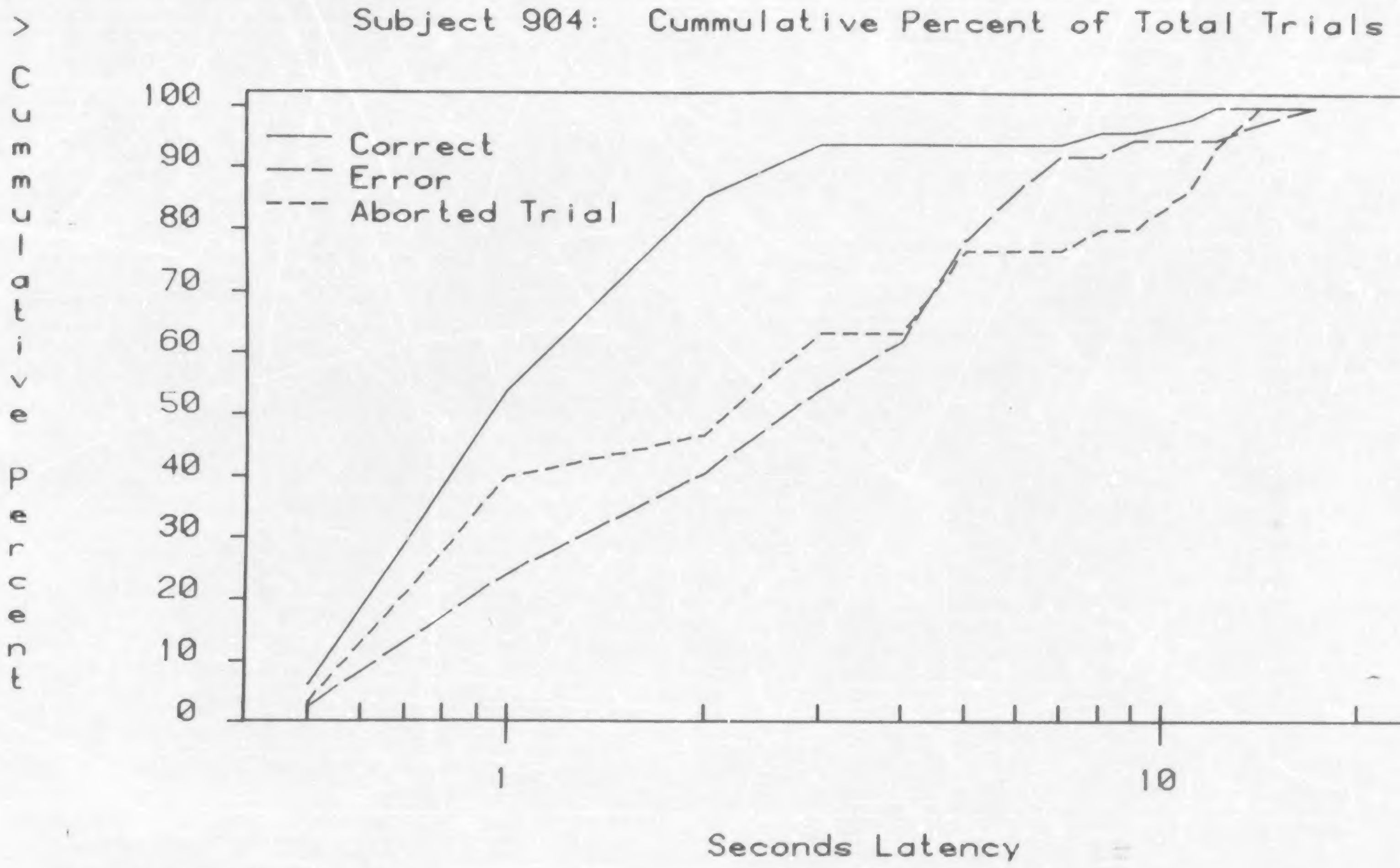
Subject 709: Cummulative Percent of Total Trials
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
Correct
Error
Aborted Trial
1
10
Seconds Latency

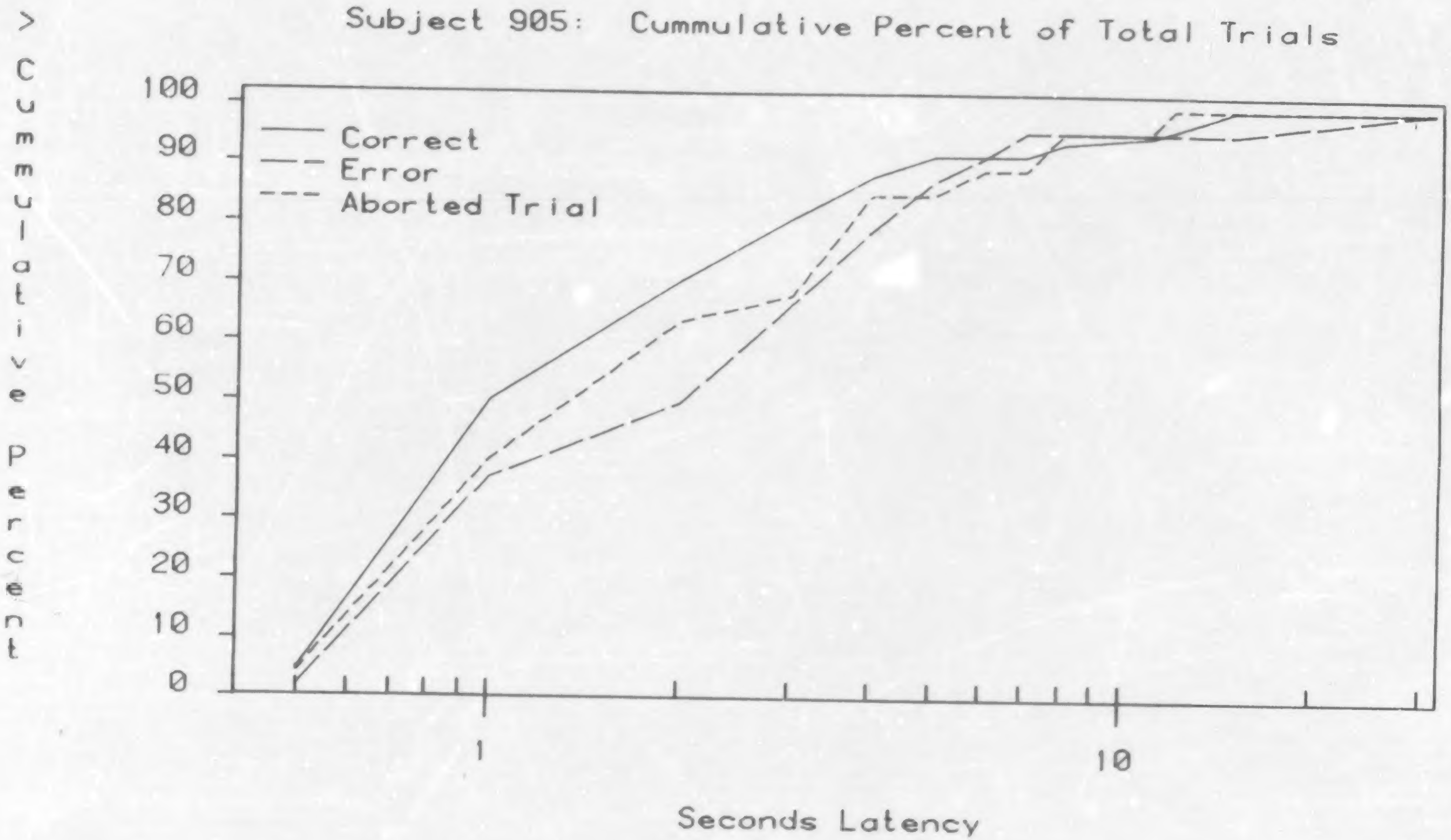


Subject 710: Cummulative Percent of Total Trials



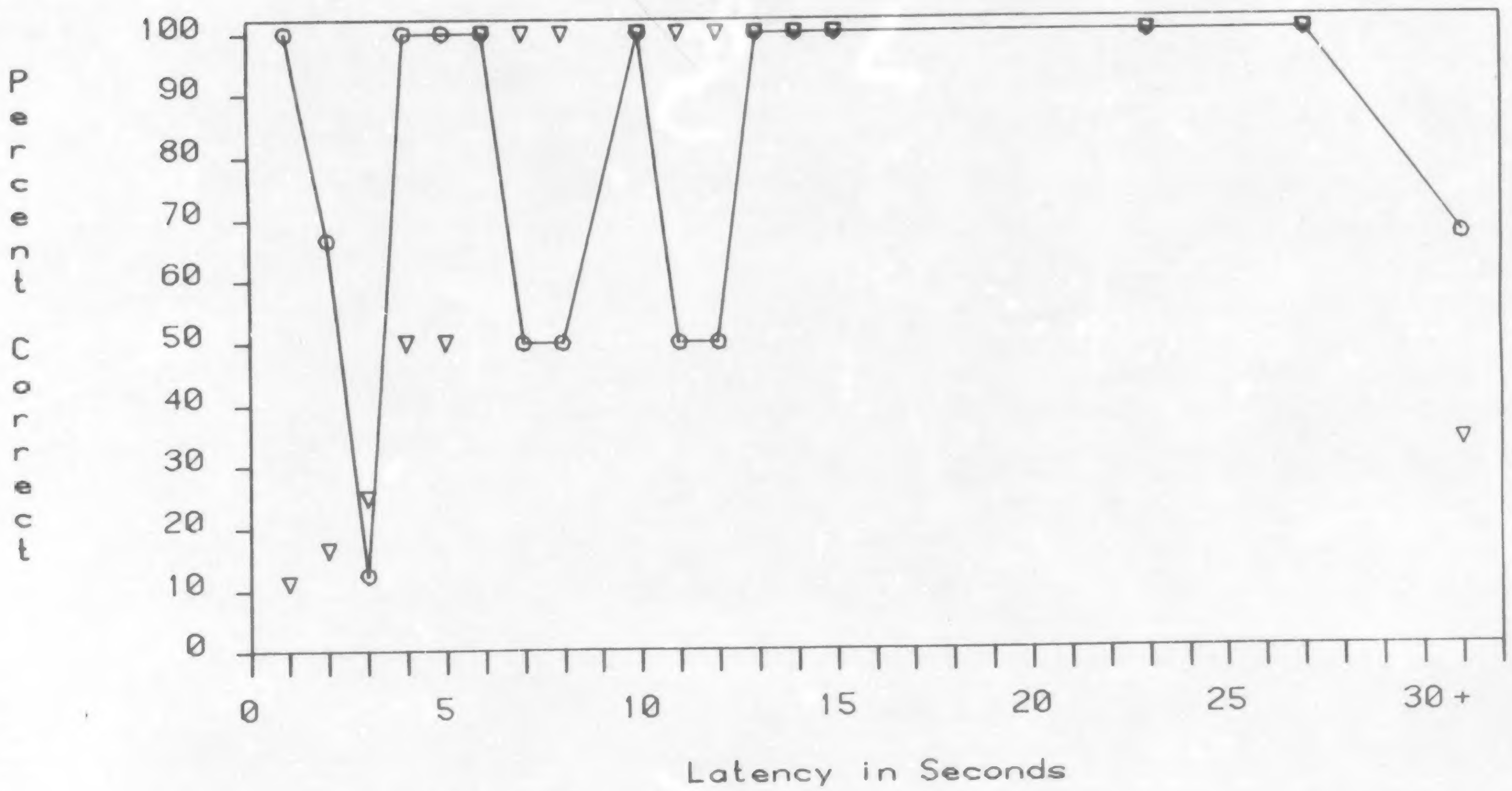
Subject 903: Cummulative Percent of Total Trials


Subject 904: Cummulative Percent of Total Trials
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
Correct
Error
Aborted Trial
1
10
Seconds Latency


Subject 905: Cummulative Percent of Total Trials
Correct
Error
Aborted Trial
> Cummulative Percent
100
90
80
70
60
50
40
30
20
10
0
1
10
Seconds Latency

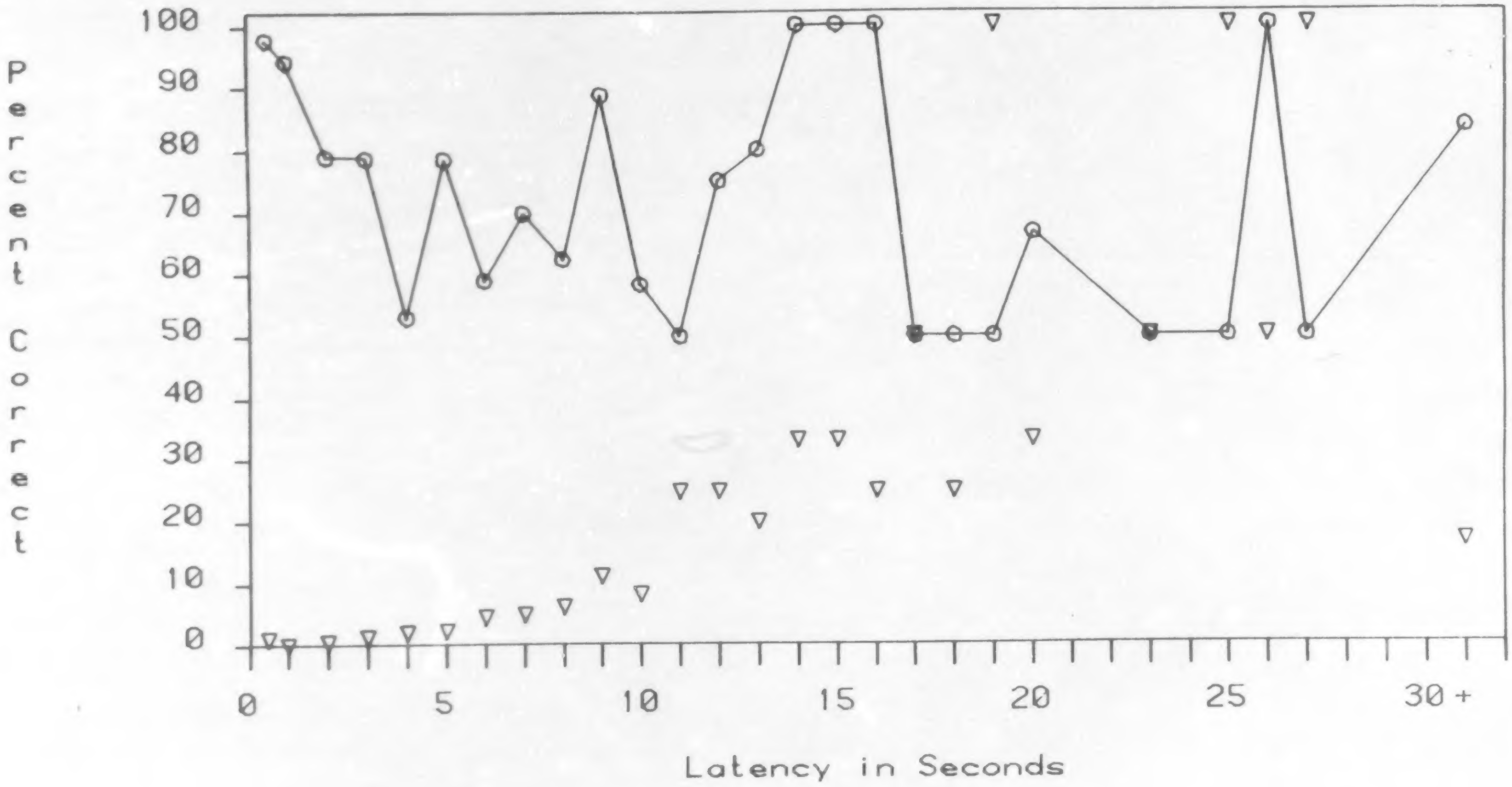
>

Subject 403: Percent Correct x Seconds Latency

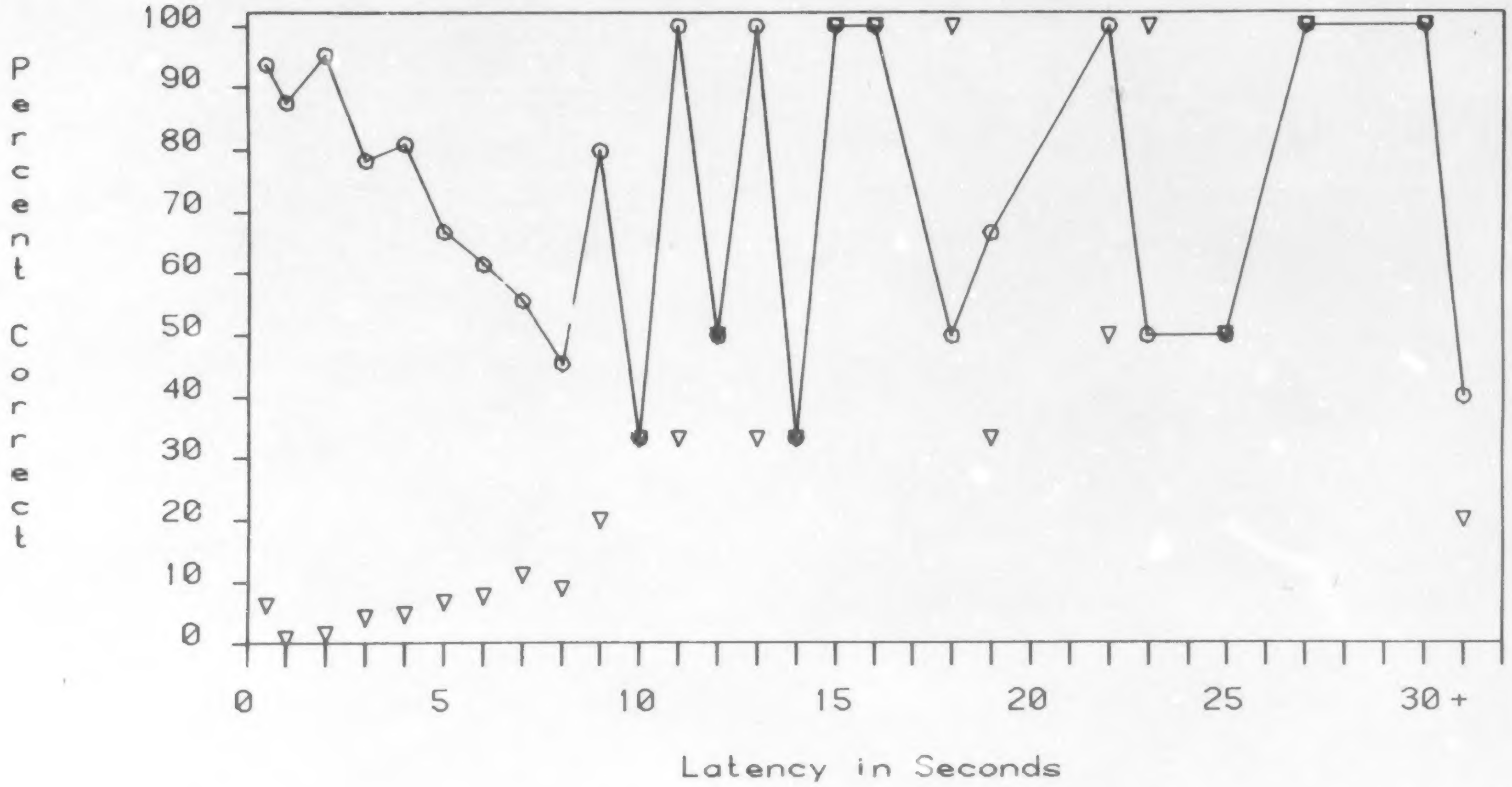


>

Subject 702: Percent Correct x Seconds Latency



Subject 706: Percent Correct x Seconds Latency



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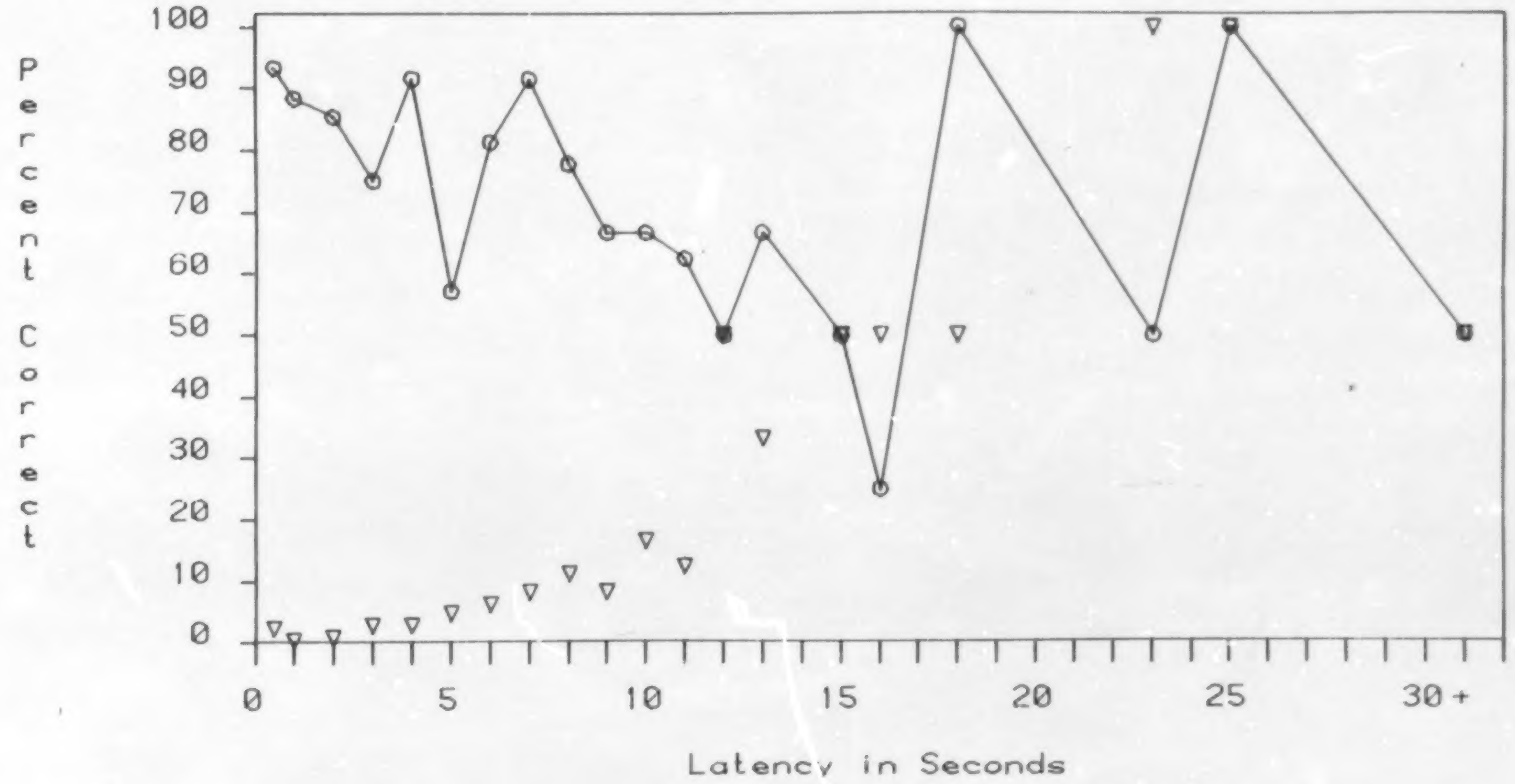
Subject 707: Percent Correct x Seconds Latency



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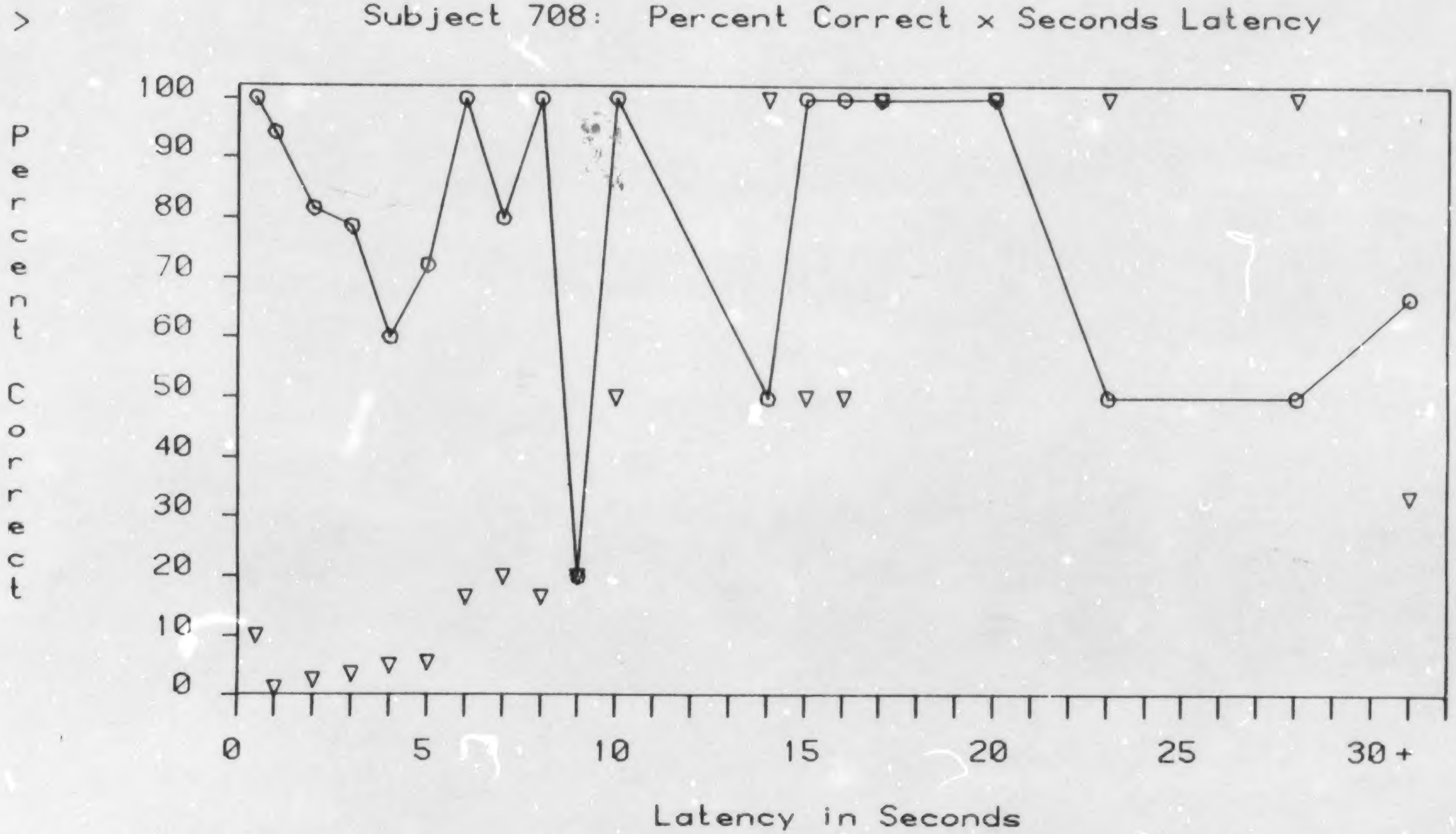
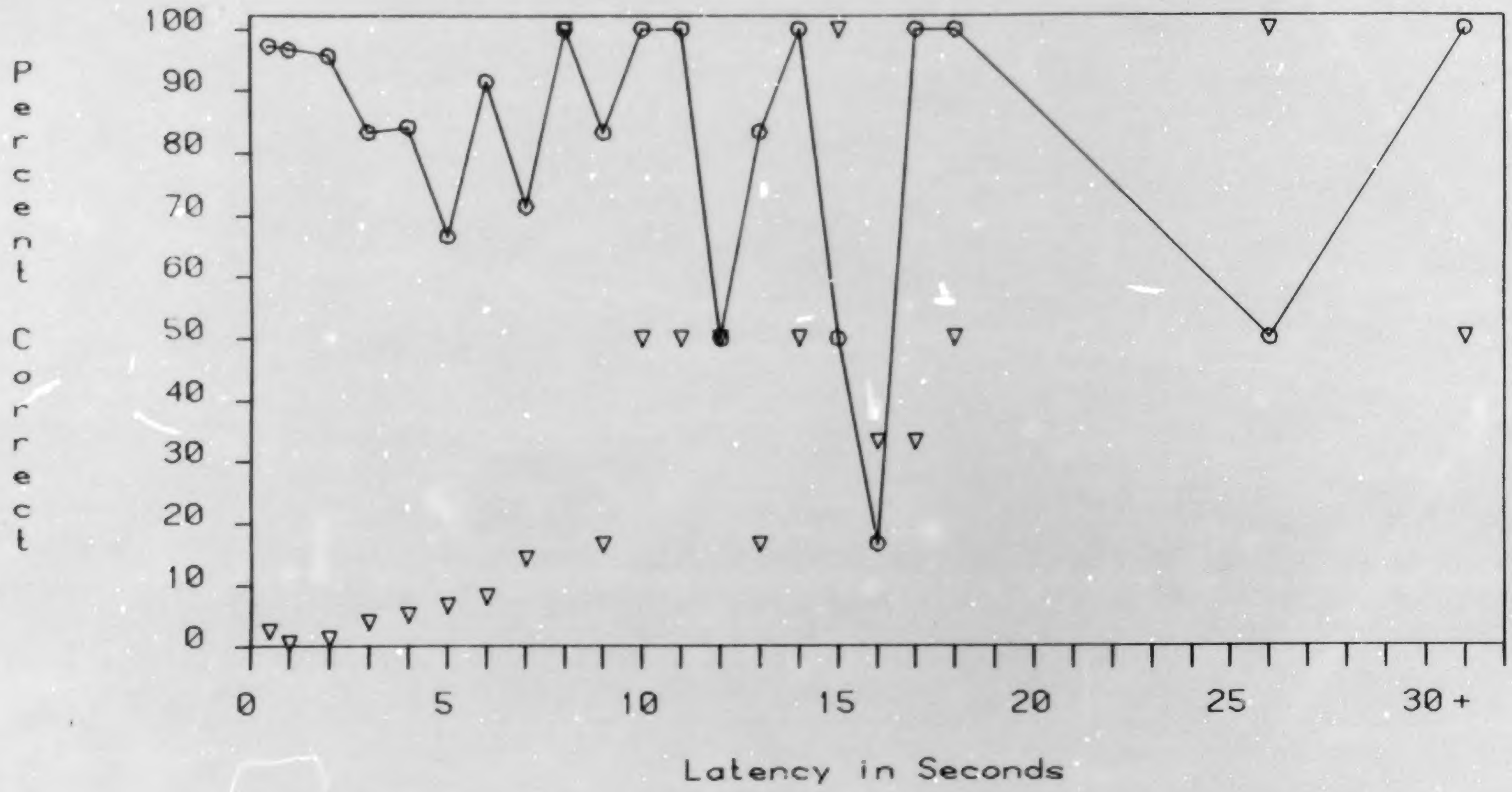
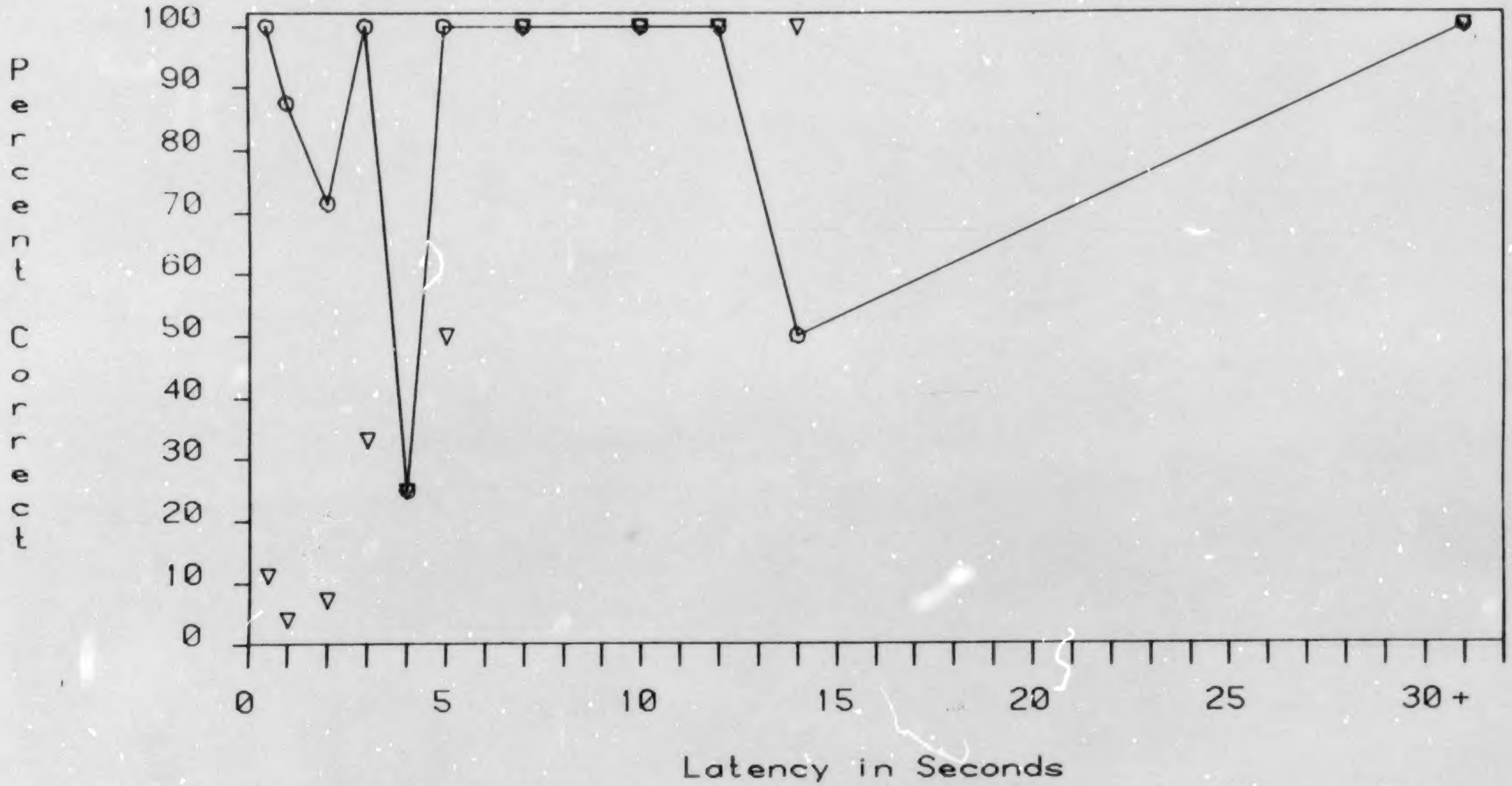

Subject 708: Percent Correct x Seconds Latency
Percent Correct
100
90
80
70
60
50
40
30
20
10
0
0
5
10
15
20
25
30 +
Latency in Seconds

Subject 709: Correct Percent x Seconds Latency



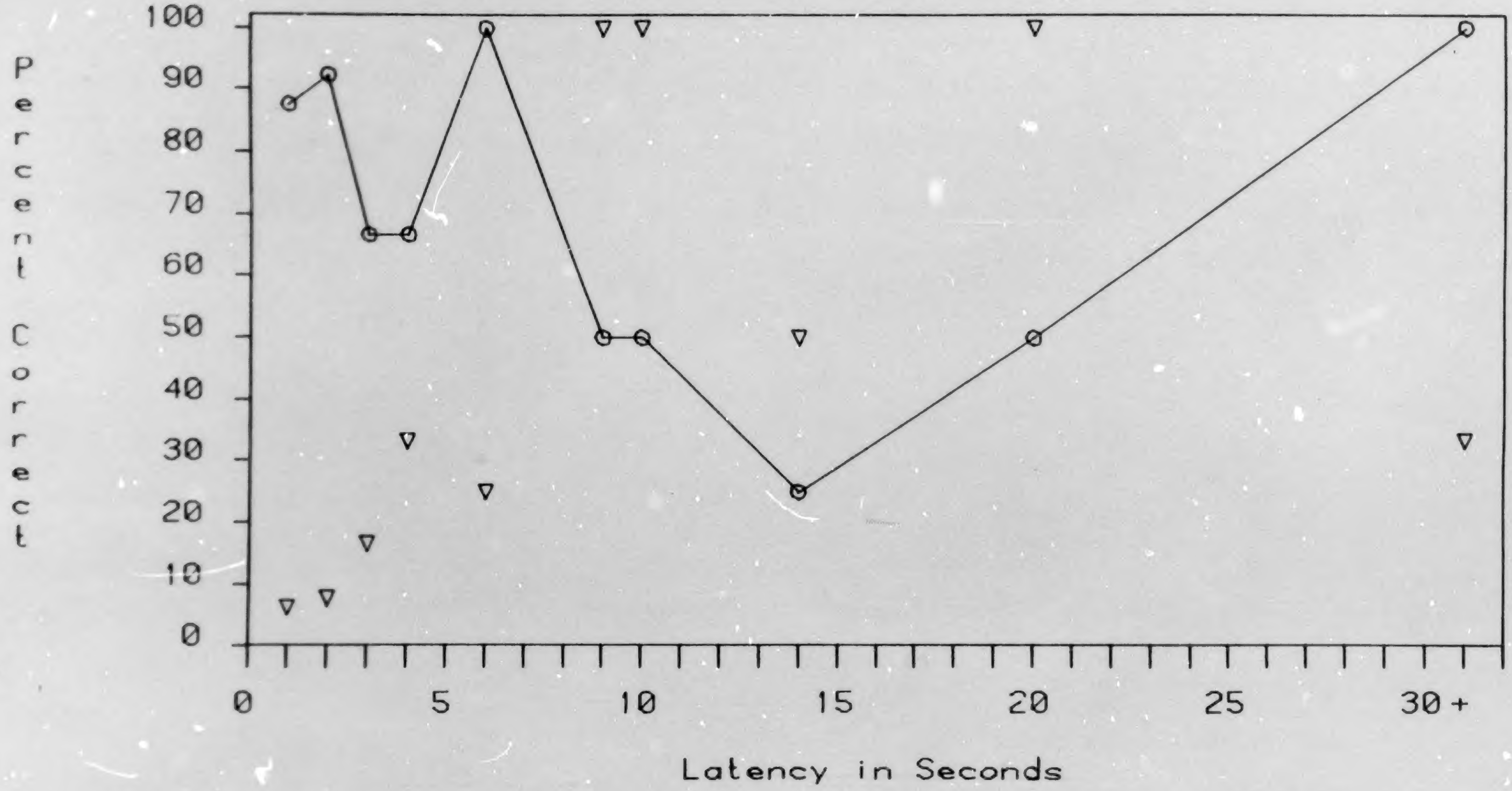
>

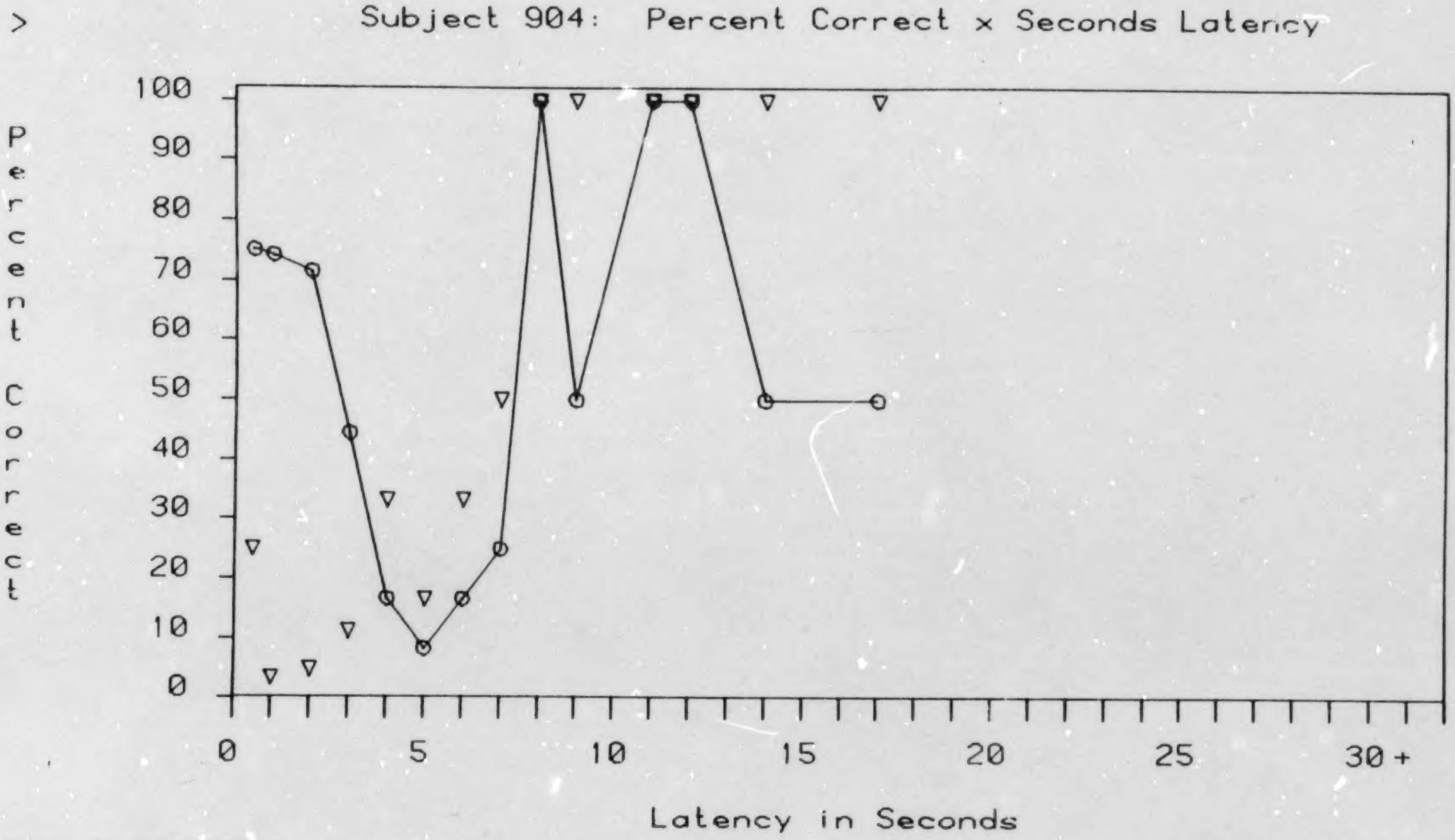
Subject 710: Percent Correct x Seconds Latency



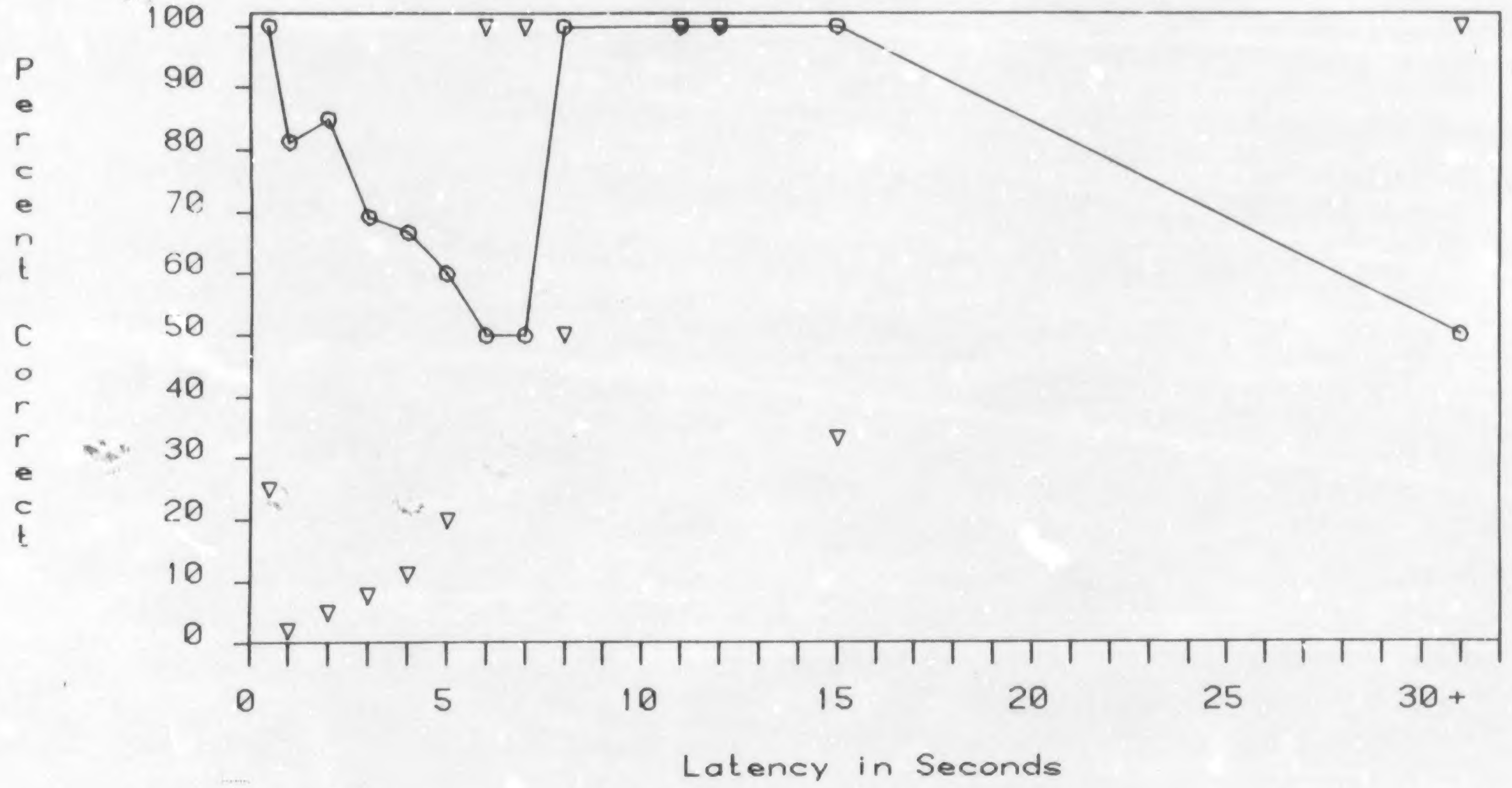
gr

Subject 903: Percent Correct x Seconds Latency

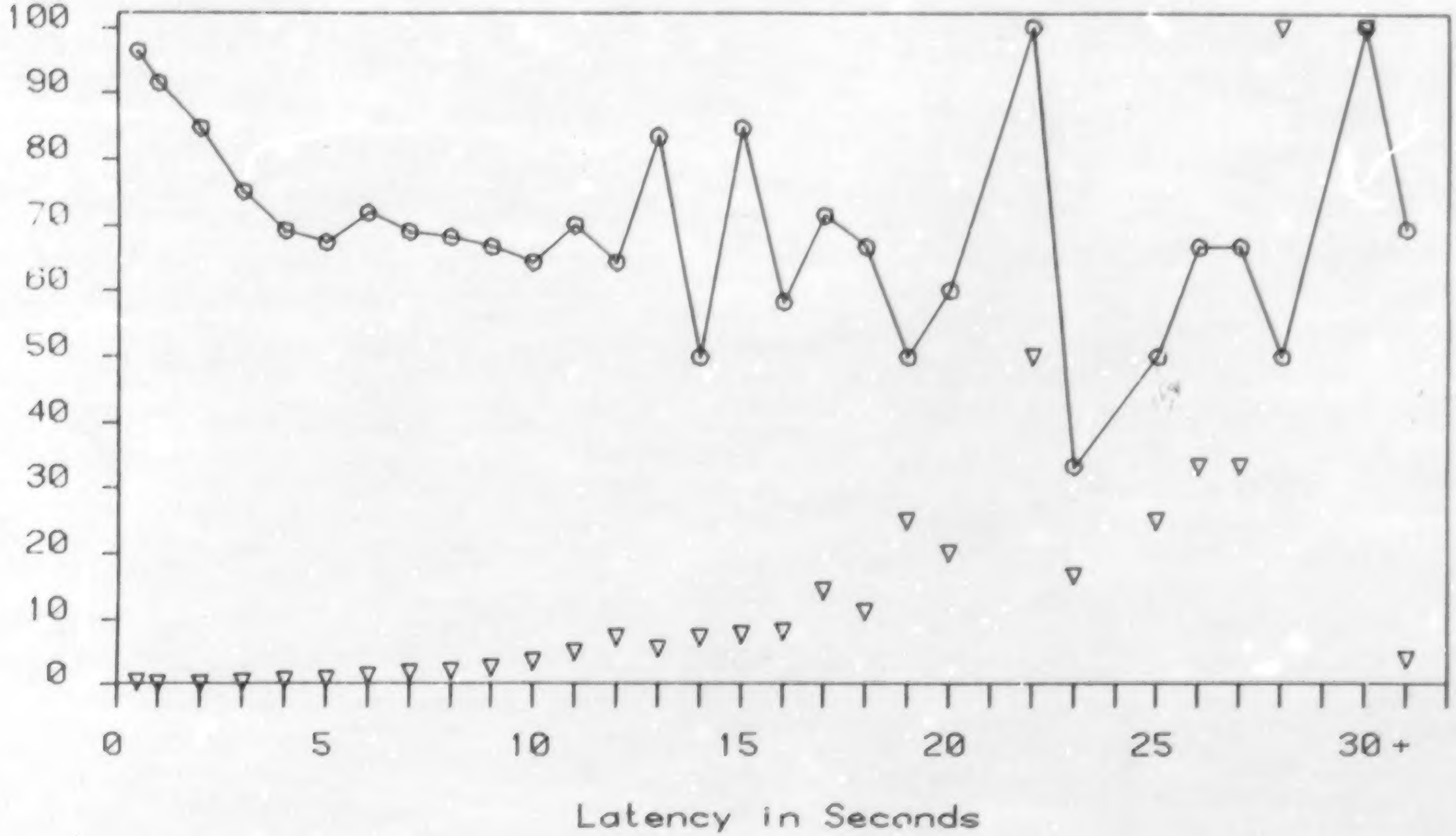



Subject 904: Percent Correct x Seconds Latency

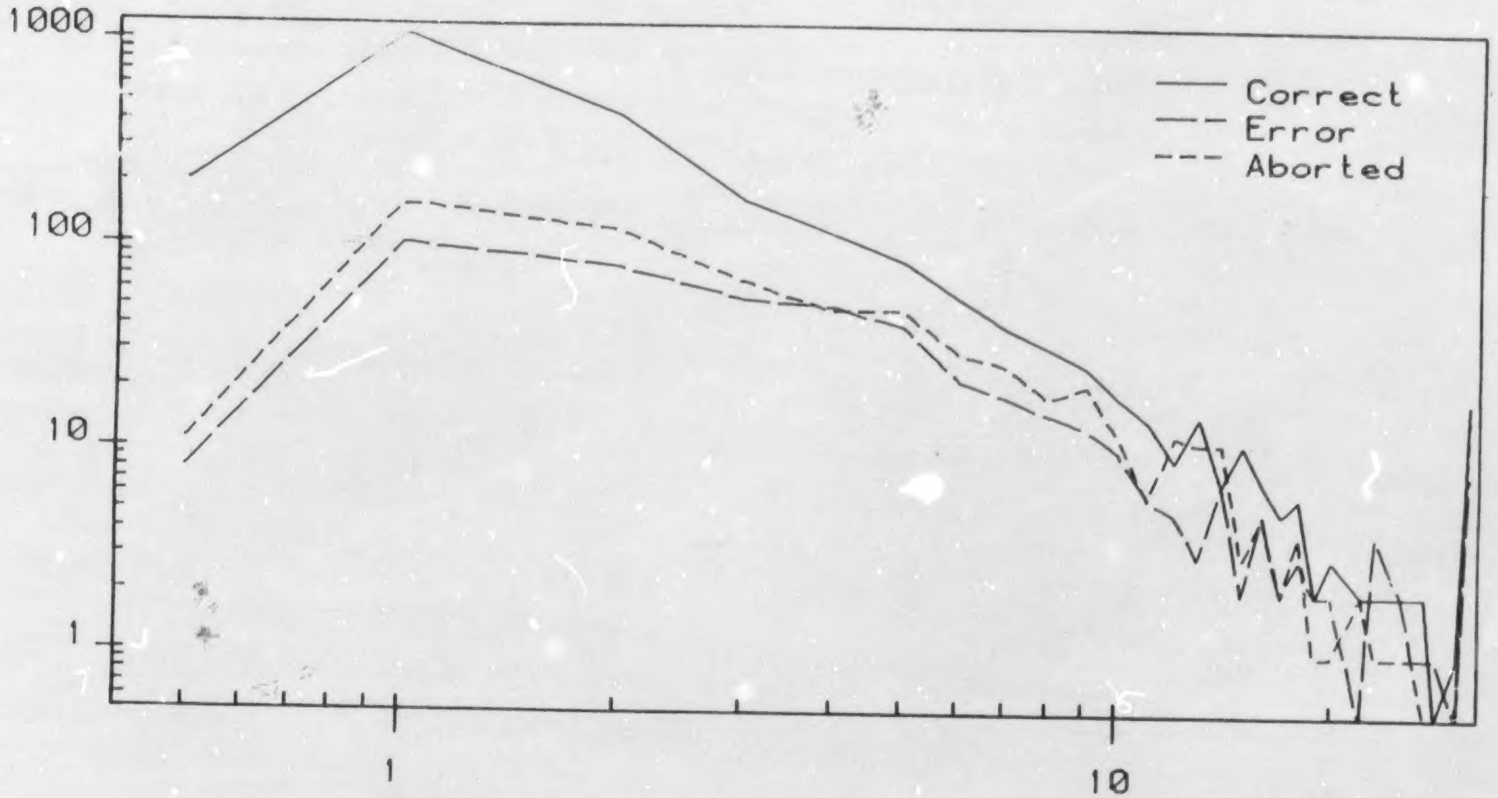
Subject 905: Percent Correct x Seconds Latency

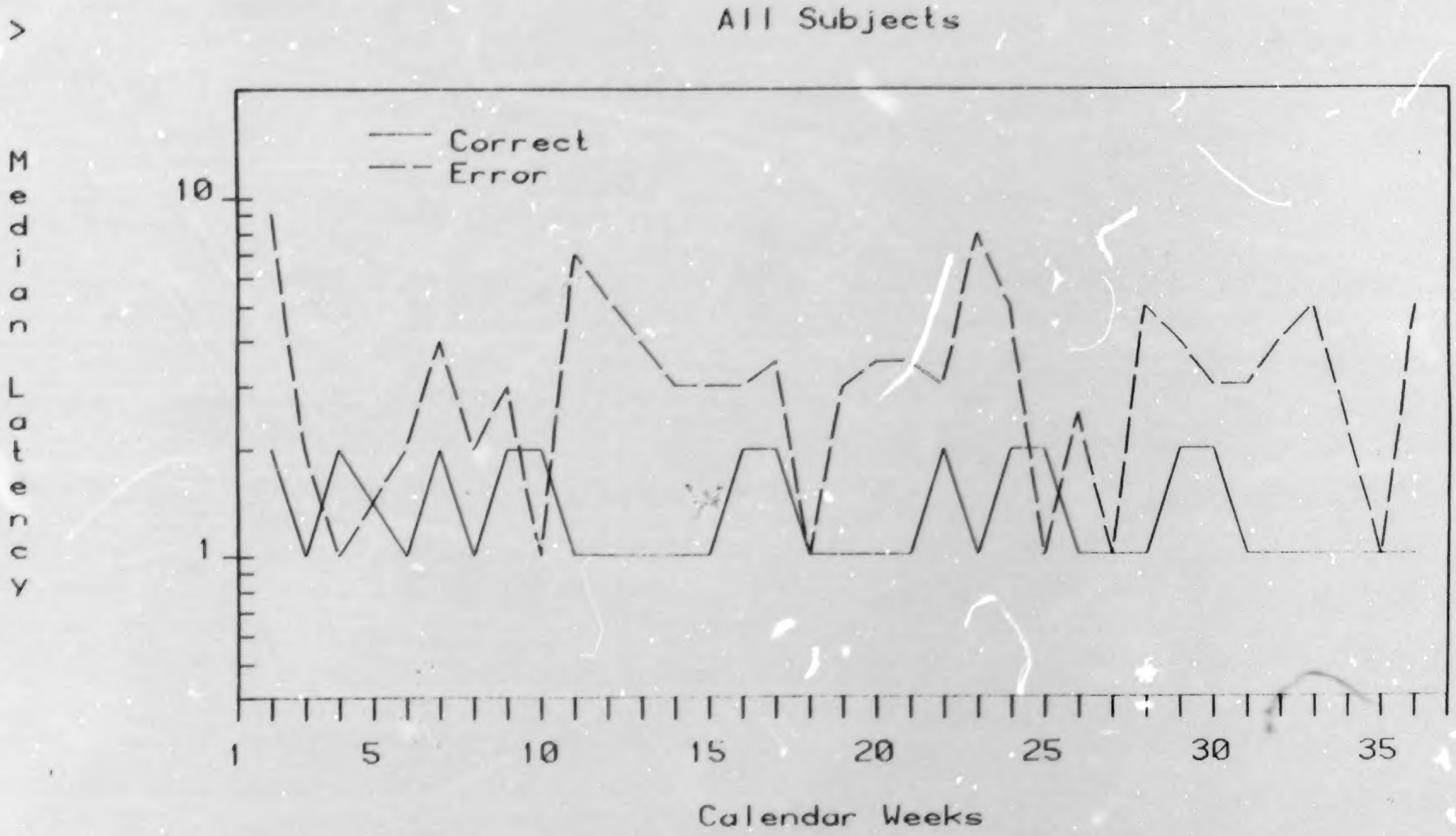


All Subjects:  Percent Correct x Seconds Latency



>


1000
100
10
1
1
10
Correct
Error
Aborted


All Subjects
Correct
Error
Median Latency
10
1
1
5
10
15
20
25
30
35
Calendar Weeks